The Builder.

VOL. XXXIV. No. 1729. SATURDAY, MARCH 25, 1876.

ILLUSTRATIONS.

Bognor Waterworks: Section of Well 281
Sir Isaac Newton's House, St. Martin's Fields 286
Street Architecture, Sweden: A Residence in Blasieholmen, Stockholm.—Herr Helgo Zettervall, Architect 288, 289

CONTENTS.

The Gas-lighting of Paris 277
The Blake Drawings at the Burlington Art Club 278
The Metropolitan Building Act: Architectural Association 279
The Birmingham Improvement Scheme 280
Bognor Waterworks 281
Westminster Abbey and its Memories: In Memoriam 282
An Old Gate-Pier 283
The Gale and the Telegraph Wires 283
Some Old Houses and their Stories: Sir Isaac Newton's House in St. Martin's Fields 284
Modern Street Architecture in Stockholm 286
Victoria (Philosophical) Institute 286
New Churches in South London: Visit of the Architectural Association 291
Houses in Flats 291
Light and Colour 291
The New Catholic Apostolic Church, Camberwell New-road 292
Licences for Hoardings: Vestry no Power to make Conditions .. 292
The Traffic at Hyde Park Corner 293
The Liverpool New Water Supply 293
The Art Union of Ireland 293
The Proposed Approach to the Embankment from the Savoy, and the New Mint Buildings 293
The New Assessment of Property in Bermondsey and Elsewhere 293
Effectual Filtration 293
The British and American Archæological Society, Rome 294
Glasgow Institute of Architects 294
"Institut des Arts Industriels" 294
Northumberland Avenue 294
The Sanitary Condition of West Houghton: a Plain-spoken Medical Officer of Health 294
Damp-proof Building Material 294
Setting out Angles 295
Damages for Excess of Time: Millard v. New Civil Service Co-operation, New Queen Victoria-street 295
Damage to Stone Carvings in Transit by Rail: Bolton v. Midland Railway Company 296
Practice of Employing Partially Clerks of Works 296
Liability of Employers: Wicks v. The National Safe Deposit Company (Limited) 296
Claim against a County Surveyor: Adamson v. Crozier 296
Darlington 296
Armorial Bearings 296
Education of Bricklayers 296
Tithe-Rent Charge 296
Substitute for Slates 296
Early Glass 296
Water-Waste Preventers 296
A Building Bee 296
A Proposed Bridge across the Thames 297
Staines Town Hall Competition 297
Railway Collisions 297
London Board Schools 297
School Board Schools 297
Books received: Davis's Architectural Studies in France 297
Miscellanea 297

The Gas-Lighting of Paris.

THE Report just issued by the Municipality of Paris upon this subject is not altogether new, but rather an amplification—a very valuable one, however,—on that of 1873, dealing with a question which, in this country, never sleeps. Like all French documents of the kind, it has an historical preface, and the practice is not without a certain utility of its own. During long centuries, the French capital, a labyrinth of narrow and crooked streets, and frightful no-thoroughfares, gained a repute as the most dangerous and infested city of Europe. The inhabitants, warned by no Curfew-bell, wandered *au claire de la lune*, but it is impossible to do more, in the space permissible, than indicate the gradual progress by which the actual brilliance of the Boulevards,—the best lighted thoroughfares of Europe, the Unter-den-Linden of Berlin not excepted,—has been attained. In the middle of the sixteenth century, it was ordained that there should be a lantern at every corner, or a fire-basket, answering the same purpose. This regulation left half the town, after dark, in a state of blindness. A hundred years elapsed before the Parliament of Paris ordained that every grocer should keep in stock candles of yellow wax, weighing not less than twenty ounces each, and having the Royal arms stamped upon them, and also glass-enclosed lamps for the convenience of traffic. A few years later, however, Nicolas de la Raynie, founder of the Parisian police, established the Parisian system of public lighting. His motto was, — "Promptness, brightness, and safety." The difficulties he encountered were enormous, and it is a fact of significance in social history that the opposition of Alsatia counted for much as an obstacle to this far-sighted scheme. He found Paris with a lantern suspended here and there from a rope swung across the street, almost invisible in winter time, and totally extinguished, on grounds of economy, in the summer. It was positively a question with the noble and the business classes whether the lighting season should begin on the 1st of October and end on the 1st of April, or commence on October 15th and cease on a similar date in March. To the mind of the living generation, these controversies appear surely impossible. It will not do, however, to linger among antiquities. At the close of the seventeenth century, then, Paris consumed eighteen hundred pounds weight of common wax each night, and was not half so well illuminated as are the Polar regions in mid-winter. Later on tallow was adopted for the sake of cheapness, and the "light thickened," to the infinite profit of foot-pads. It was of this darkness made visible that Sterne so pathetically complained. "I saw," he says, "what I thought was a minute fixed star, high above the fog, for there are French fogs, and it proved to be a public light, which merely served to mislead." Next came the era of a patent,—twisted cotton dipped in oil, and aided by reflectors. Now the Parisians thought they had arrived at the *ne plus ultra*, and they laughed at their ancient Feasts of Lanterns. Ten thousand of these were unhung, and the fresh invention took their places. It is upon record that the lieutenant of police had some difficulty in restraining the popular delight when it was found that a carriage could travel 300 yards without a company of torch-bearers. Generations passed, and in the epoch of the Revolution, the solitary and sinister illustration to be noted upon the subject is the fearful cry of "*À la lanterne!*" "You will see a little clearer then," said a Republican to a Royalist patriot. The public lamps were at that time somewhat similar to those of antiquity, such as are still used in Italy and the East, flat, urn-shaped vessels of coarse bronze or tin, replaced in 1787 by the first crude inventions of Argand, whose name has come down to us, but whose reward was stolen from him by his partner,—which is not an unfrequent case in these histories. But all these improvements failed to satisfy the growing necessity for an increased power and an increased expansion of the illuminating element. Their numbers increased, yet the results were complained of until gas was introduced, and, even then, so clumsy was the method of its introduction, that the car conveying the remains of Napoleon I. brought back from St. Helena, was left on a Boulevard all night, owing to a hitch in the system. From that time the advance was rapid, and in 1850 Paris was lighted by 3,000 reflectors (equivalent, perhaps, to our Bude lights), and 9,000 gas-lamps. But the idea of the new illumination had not been adopted without a long and strange controversy. It was attributed to sorcery: the lamp-glasses were broken; the experimental lights in the Passage des Panoramas, evening after evening, were violently put out; those around the Théâtre de l'Odéon, in the most intellectual quarter of the city, were ruthlessly extinguished; seven gas companies collapsed in succession, on account of the general prejudice, which declared that this novelty would poison the atmosphere, and prevent the people from breathing. Then occurred an episode very French in its character. On the last day of December, 1839, the Rue de la Paix was, without previous announcement, lighted up with gas; six months later the Rue Vivienne followed suit; yet still the opposition was not quelled. Charles Nodier took the lead, affirming that the trees would wither, the *cafés* be choked, the picture-galleries ruined, the population suffocated, vehicles misled, houses set on fire, and—save the mark!—cholera attracted. At length, however, common sense prevailed, and M. Nodier himself—the Sibthorpe of his day—rejoiced in the establishment of those ten great gas-works which, extending, like fortresses in a circle round Paris, make of its nights a splendour. The work was commenced by the Compagnie Parisienne d'Éclairage et de Chauffage par le Gaz, and its operations were started in 1855. The head-quarters are in the Rue Condorcet, but they represent simply the administrative business. The principal activity is at La Villette, where stands a red house, with a bust of Racine in front of it, in the midst of a scorched and barren land. Here the gas-people may be seen at work, hot and half-dressed, amid furnace-flames and hills of coke, enormous workshops, tunnels of uncouth form, stone or brick cottages, and all else that constitutes the unsightliness of a manufacturing centre. The apparatus—to employ the term in its largest sense—is complete. Every metal implement or utensil can be wrought upon the spot; there are kilns for bricks, and distilleries for the utilisation of ammoniacal liquor. A railway encompasses the works, with stations pointing, as it were, towards every region of France; a special line brings the supply of English and Belgian coal. The sight of this enormous organisation is imposing, and goes far to justify the remark of Abd-el-Kader, "I have been most astonished in Paris by the stars which you put every night into your lamps."

With any differences notable between the French and English, or other European processes of manufacture and distribution, we have nothing at present to do. An account of the works themselves, when in full activity, might be made picturesque enough, in itself; but it is with the administration of this service, so essential to modern life, that we have, just now, to do. In a moment of extreme precaution, the Parisian municipality determined that all gasworks should be erected outside of the fortifications. During the siege, therefore, something like a panic existed, lest the retorts should blow up themselves and the ramparts together. But nothing of the kind happened. A shell exploded in one, at Ivry; an explosion took place, a fire burned for six or seven minutes, and no serious harm was done. So at Villette. In the hour of the Commune's triumph, indeed, the gasworks were absolutely bombarded, without the slightest interruption to their activity, unless when every man had to take up arms and fight. Paris, the worst-lighted city in the world formerly, in the second half of the nineteenth century could not exist without gas. In 1855 it consumed 40,777,400 cubic mètres, and in 1872, 147,688,372,—an augmentation in sixteen years of 107,000,000. How is this supply,—mighty for Paris, though not comparable with the necessities of London,—distributed? By nearly two million yards of large and small piping. But the company, while in a great degree a monopolist, is not free to break

up the roadway, or direct its main or inferior arteries, at pleasure. Paris has its "subterranean architect," who looks after more than a single interest. He will not permit gas to approach too near an aqueduct or any channel, above or underground, conveying water for domestic or sanitary purposes; he will have no leakage of one element into the other; he will not even permit an exudation from the gas-pipes into the drains, which, according to the Report, gathering in one locality might, at contact with oné of those lamps so continually carried through the Parisian sewers, blow up half a district. Consequently, the gas is distinct from the water and drainage networks, and disasters are exceedingly rare. In addition to this, the company pays to the municipal government the sum of 8,000*l.* a year for the retention of its privileges. Moreover, it has to pay for the breaking up and restoration of streets, and the re-laying of streets; but, on the other hand, the company pays coal dues in a very limited proportion, yet the Parisian tax on its public lighting amounts none the less to nearly 400,000*l.* a year, as the world is officially informed. It must be admitted that the arrangements are admirable. Eight hundred men sally forth at a given moment, and the city at dusk is suddenly enchanted, as it were, with light, without any clumsy apparatus such as we have at last got rid of, of ladders and lanterns. Twelve hundred miles are expected to be covered within forty minutes. The process of "putting out" is carried on more expeditiously still, for it takes up only half an hour. Now, when it is remembered that Paris is lighted up by 40,000 public gas jets, exclusive of grand occasions when the Arch of Triumph, the Hôtel de Ville, the Champs Élysées, are kindled into festive flames, will it be believed that large quarters of Parisare still unlighted by gas? that the old reflectors survive? that oil-lamps still hang from ropes, reminding us of the worst days in the revolutionary time? So it is, however. The police counted more than 1,000 corner reflectors and swinging lamps in the centre of civilisation last year. But, even with all the administrative accommodation, what would the French capital be in its brightest quarters without the assistance of the light which floods out from the *cafés* and shops, the opera-houses and theatres, the arcades, the galleries of the Palais Royal, and the windows of the wealthy, who, unlike the English, delight in turning forth the silver lining (of their dinner-tables) to the night? Why, a comparative dimness after all. In parts of Paris where these accessories do not abound a sort of semi-obscurity to this day prevails, and in all it may be said there is a general shadiness after the hour of eleven, p.m. Long streets may be traversed in which scarcely a glimmer is perceptible. So that, however admirable the intentions of the Parisian municipality, they have as yet been incompletely carried out, and the "darkness favourable to insurrections" has not been entirely dissipated. In one respect, the French capital requires less artificial illumination than our own. In the better quarters the white-built houses reflect and, so to speak, multiply the light, and the effect thus produced is greater than, upon a casual thought, might be imagined. "Gas," says the Report, "enters day by day more and more into our domestic habits and necessities. Before a hundred years are over, there will not be a garret without its jet. That will signify an immense advance; but it will not stop there; it must become the great economiser and preserver of warmth and of heat in every degree; it will become manageable fire, and a farther safeguard against incendiarism than any other ever suggested; it will, again, render obsolete the furnaces,—for they are nothing less,—which stifle the miserable slaves of our cramped Parisian kitchens." When a Frenchman,—and an official Frenchman,—has been brought to say this, it is clear that gas is about to play a prominent part in Parisian domestic economy. It has been a long time, however, in penetrating the routine of family habit. In 1872 there were in Paris 850,000 gas-jets taxed, of which a third, it is said, belonged to the theatres,—an almost incredible conclusion. But, it is added, "every new house, of any pretentions, has its gas in our time,—in the saloons, the dining-rooms, the ante-chambers, the staircases, the very wine-cellars themselves." "Gas," exclaim the authors of the Report, "was our auxiliary during the war; when Paris was blockaded, it enabled her to converse [through the medium of balloons, it may be presumed] with the provinces"; and in however inflated a manner the statement may be put, the truth of the matter is unquestionable. The Parisians may not have hitherto availed themselves to its utmost extent of this invaluable aid; but of what metropolis in Europe,—in the world,—cannot the same be said? There never was a city so dark as Paris of the seventeeth century, and there is none, probably, more magnificently illuminated, all shortcomings apart, than the Paris of the nineteenth.

THE BLAKE DRAWINGS AT THE BURLINGTON ART CLUB.

WHEN noticing the last collection in the rooms of the Burlington Club, the painted glass belonging to the Marquis d'Azeglio, we mentioned that a collection was about to be formed there of drawings and designs by William Blake. This, which will shortly be open to visitors, under the usual regulations, is of even more interest than admirers of the work of that extraordinary genius would have anticipated. The number of drawings got together is considerable, filling entirely the whole space of the room usually devoted to exhibitions; and as scarcely any of the drawings are large, it will be seen that this implies a tolerably extensive collection. It is true that some of the most complete and characteristic developments of Blake's genius are not represented here, as they occur in the copies of illustrated poems, the finest specimens of which are in the hands of amateurs, who think them, probably, too precious to lend. Some very remarkable copies also are to be seen in the print-room of the British Museum. But there is enough in the drawings now hung at the Burlington Club to afford the greatest interest and enjoyment to those who are already acquainted with the published designs of Blake, and no little matter for astonishment to those who are not, and who will find themselves almost in a new artistic world on entering the first-floor room in Savile-row.

The special characteristic of Blake's genius, as developed in his drawings (for into the wider consideration of his whole intellectual and mental position as evidenced in his life and writings we can hardly enter here), is what has been well called by Mr. W. B. Scott, in his preface to the printed catalogue, its "super-sensuousness." His figures are not reproductions of nature, except, of course, within certain limits, but might be called embodied thoughts. Although Blake, in these productions, and even in his poems, is not half so obscure and enigmatical as some very matter-of-fact people imagine, it is necessary to be to a certain extent acquainted with the artist's history and turn of mind, and to look at his works from his own standpoint, in order to duly appreciate their extraordinary but peculiar power. It is necessary to remember that the imitation of accidental facts of nature, the facts of texture and form and colour, made no part of Blake's object, unless in a few very exceptional instances. His aim was to express or imply, through the human form, the thought or feeling that was always the basis of his work. His figure-drawing and design, and composition, cannot be judged, with any fairness, according to ordinary standards of academical correctness. His figures, in their expression and action, are concentrated and sometimes most powerful expressions of abstract passions or ideas, the general intention of which is usually obvious enough (at least to those who bring any imagination of their own to meet that of the artist), though it would often be nearly impossible to translate it into words. This predominance of the mental over the physical part of the art in Blake's designs renders his frequent eccentricities and peculiarities of drawing of far less moment than would otherwise be the case. His variations in figure-drawing are, in fact, very curious. Sometimes, but rarely, he adheres with almost scrupulous fidelity to nature. In many cases, on the other hand, his figures seem built up almost according to the inspiration of the artist, and the requirements of the particular expression or effect aimed at. But this special aim, whatever it may chance to be, is, for the most part, so powerfully and directly rendered, that the eccentricities of drawing are passed over as merely a part of the artist's peculiarity of language. It is owing to this super-sensuous character, again, that there is so much to be found in many of his slighter sketches, and that, in fact, these fully equal, and sometimes surpass in value, the more elaborate and finished drawings.

Those who intend to avail themselves of this opportunity of making acquaintance with the works of one of the most remarkable men in the history of English art should, if hitherto unacquainted with the subject (and the almost utter ignorance about Blake among well-educated people has often been matter of surprise to us), look through the life of the artist by Gilchrist, or the critical essay by Mr. Swinburne; the latter, in fact, the most valuable work of the two as a piece of literary art-criticism, though requiring much allowance to be made for the author's exaggerated and over-enthusiastic style. A glance at either of these works, however, together with the prefatory essay in the catalogue (which gives a good deal in a little space), will enable the visitor previously unacquainted with Blake to visit the collection with some idea what to expect and what to look for.

Blake's modes of execution were very various, and one of the things which will strike even those acquainted with his published works is the remarkable distinction and dissimilarity between one branch of his work and another, in regard to style and execution. Most of his best things are in water-colour; but even here we recognise several distinct styles. The two or three carefully-finished drawings illustrating the story of Joseph and his brethren are, both in execution and conception, more after the manner of ordinary mortals than most of his works, and scarcely anything else in the room resembles them; visitors who had been initiated into the most Blakian only of the artist's productions would scarcely ascribe them to him at all, though perhaps it would be hard to say who else could or would have done them. The "Lazar-house" (from Milton), which hangs near these (No. 19), is a typical specimen of his more unearthly style, with figures of almost sculpturesque severity and solidity of manner, emphasised the more, here and there, by a tendency to strong and thick outline. Here, too, the colouring is weird and supernatural, as in other designs of a similar type, such as the "Tenth Plague of Egypt" (134), where a gigantic scaly demon stalks through the city dealing death on all sides: a tremendous embodiment of "the pestilence that walketh in darkness." Then, in the beautiful series of designs from "Paradise Lost," we have quite another tone and temper, these drawings being finished mostly in light cool tints, with an effect verging at times towards that of monochrome. Of the beauty of design and feeling in this set of drawings too much could hardly be said. The subject, mainly the history of Adam and Eve, as told by Milton, gave the artist opportunities and suggestions after his own heart for the treatment of the human figure in the highest and noblest type he could realise. One or two of the figures of Eve in the series are most remarkable for the combination of dignity and simplicity which they exhibit. His power in another way is shown in the illustration of Sin and Death disputing the passage of Satan through the infernal gate; the shadowy figure of Death is of extraordinary force and fury of expression, and may be said, without fear of contradiction, to be the most successful attempt ever made to embody Milton's conception in drawing. It is worth while also to compare the larger and final designs in the series with some of the smaller studies for them, and notice the progress and slight modifications in the artist's idea.

Of oil painting, as we generally use the term, there is nothing; and in estimating the technical power of Blake, as well as his tendencies in style, it is important to remember that he was bred an engraver, and received no regular painter's education at all. It was partly owing to this, no doubt, that he took to such singular and abnormal methods of manipulation, which may have in some instances helped his individuality of style, but have also no doubt had the effect, and will have the effect, of repelling the large class of every-day picture-fanciers who are puzzled and even indignant at anything out of their usual experience. The paintings which take, æsthetically, the place of oil pictures with Blake, are in tempera, oiled over, with an idea of giving "tone," it is to be supposed. An analogous habit of the painter was that of varnishing his water-colours; a most pernicious process, it is needless to say, in regard to all that constitutes the real beauty of tone and texture in water-colour. A certain proportion of these oiled temperas, again, form a class by themselves, recognisable at a glance, and which we have seen very well characterised, somewhere, as presenting the appearance of having been painted on a mahogany table, "with the colour of the

mahogany left for the high lights." This last, however, is not a strictly correct way of putting it, as in several of these works a strong yellow tint is partially applied so as to produce an effect something like gilding. The combination of a kind of metallic lustre with the deep and sometimes almost impalpable darkness of the parts in shadow, gives an extraordinary effect to these productions. It was in this style that Blake preferred to embody some of his most important conceptions. The finest specimen here is perhaps the "Spiritual Form of Napoleon" (90), a powerful figure chained to the ground and in violent action, surrounded by angels or demons (for with Blake the two classes of beings are nearly synonymous). If the precise meaning of this design is difficult to define, its nature and general purport, as an allegorical representation, are obvious enough. Two slightly differing designs of "Satan calling the rebel Angels," in this manner of execution, are truly magnificent in composition and in their shadowy lurid effect.

Of the most characteristic, in one sense, of all Blake's productions, we have not yet spoken: we mean the poetical and imaginative works engraved, both letterpress and illustrations, by himself. These works, of which the best known, and, in a literary point of view the most valuable, is the "Songs of Innocence and Experience," we owe, it might be said, indirectly to Blake's poverty. He could not afford to publish in the ordinary manner; so he wrote out his poems in a beautifully neat and clear hand, something between writing and print character, on copper with a medium insoluble by acid, with which latter the interstices of the design and writing were subsequently bitten down, leaving the design in relief in a kind of stereotype form. Impressions were printed from these, and subsequently coloured by hand with various degrees of finish and brilliancy, according to the artist's mood, or his regard for the appreciation of the giver of the commission. In most of these a pictorial design occupies the head or foot of the poem, or both, and a decorative design winds about the margin and in and out between the verses, or branches out from the letters themselves. The variety and beauty of these decorations are extraordinary; and indeed, in regard to the whole exhibition, we cannot but observe how numerous are the suggestions and types for decorative design to be gleaned from Blake, independently of his higher powers. The beauty and the deep moral significance of some of the pictorial embellishments must be studied, and studied by congenial minds, to be appreciated. We must guard the visitor to the Arts Club collection, however, against judging of Blake's power in this kind of work only from what he sees there. Many of the illustrated works are much beyond this in power and grandeur, though none perhaps exceed it in beauty; but copies are scarce, and the few specimens of them at Savile-row are not good impressions. Those who possess the really fine impressions are chary of lending them,—and no wonder.

The best known of Blake's engraved works is, or was, the "Young's Night Thoughts," a folio book with large-size engravings, some rather grotesque, many of them of great and original power and grandeur. Since the publication of Gilchrist's "Life," however, more notice has been attracted to the designs to the Book of Job, one of the finest series the artist ever drew. A very fine set of impressions from the original engravings, of which reduced copies were published by Gilchrist, is framed in the room. The illustrations to Blair's "Grave" have also become somewhat generally known; these designs, however, are engraved by Schiavonetti, whose finished handiwork appealed much more to popular taste, probably, than Blake's own singular and unusual style of engraving. All, however, who look at art from an artist's point of view, will rate at its true value the interest of individual style and workmanship, and prize it far beyond the mere "handiwork" finish of the professional engraver. In this connexion the frame of small engravings to Philips's Pastorals should be examined: they exhibit wood engraving reduced, one might say, to its primary elements, and are most interesting as specimens of the work of a master mind turning to a fresh medium of expression and using it in his own way. They were the object of the sneers of engravers and publishers contemporary with Blake; they are now among the treasures of artists, and give the principal if not the only value to the book they were formerly not thought good enough for as illustrations. Such are the fallacies of contemporary judgment on a genius who is in advance of his generation.

We have indicated but in a brief and cursory manner the chief characteristics of this remarkable collection of drawings, and space would fail us to refer in detail to half of the most interesting among them, where, indeed, all deserve to be so classed. The drawings are to remain at the club, we believe, for two or three months, and we hope that many will be able to avail themselves of the opportunity of making the acquaintance of a lofty genius whose true stature has only recently begun to be rightly estimated.

THE METROPOLITAN BUILDING ACT.

ARCHITECTURAL ASSOCIATION.

AT the ordinary fortnightly meeting of this Association on the 17th inst., Mr. John S. Quilter in the chair, Messrs. C. McLachlan and F. P. Huggins were elected members. Votes of thanks were given to Mr. G. G. Scott, jun., and to Mr. James Fowler, for allowing the Association to visit the new churches of St. Agnes, Kennington, and St. Mary, Newington, respectively; and it was announced that the next visit of the Association would take place to-day (Saturday) to some industrial dwellings now in course of erection at Pimlico under the superintendence of Mr. Darbishire.

Mr. T. Roger Smith then read the following paper "On the Metropolitan Building Act":—

The Metropolitan Building Act bears more or less directly upon the work in which all of us are now engaged, for we all are occupied in one shape or another upon buildings within the limits of the metropolis, and it will affect the future professional engagements of that large proportion of our members who are proposing to remain in London.

No architect, and no architect's assistant, can do work in any way connected with the new buildings, or alterations in the metropolis, without its being necessary for him to know what the law which governs buildings in London requires shall be done; and I have therefore thought that some account of the Building Act might prove useful to the members of this Association.

There are other Acts, and there are many legal rights which bear upon building, and upon London buildings; but it would require many evenings instead of one to give them an examination. This paper will be strictly confined to the Building Act (except that one or two of the requirements of the Metropolitan Local Management Act must be referred to), and it will not touch the other matters which go to make up building law, a subject which might, however, I think, be most usefully taken up by the Association.

In dealing with the Metropolitan Building Act, it is my desire to make you acquainted with the principles upon which it proceeds, rather than with the details of its enactments, and in this way probably you will best gain an insight into the subject. If we were to take the Act and go through it from beginning to end, many points of detail might be mentioned which will be passed over to-night; but in all probability you would be wearied rather than instructed. If I can show you what objects are aimed at, and what are the portions of the Act which are intended to secure those objects, I may perhaps succeed in giving you clear leading ideas upon the subject. You may then afterwards, without difficulty, trace out for yourselves the details as you require to apply them.

One or two preliminary matters must, however, be disposed of. First comes the question of the necessity for legislation at all. How does it come to pass that if an Englishman's house is his castle, he may not build that castle in London without being in various ways bound by a special and somewhat strict law? The short answer is that every man in London has a great many neighbours. Even the builder of a castle, when castles *were* castles, was very much controlled and constrained by his neighbour. He would have made a much more roomy, pleasant dwelling of it had he not been obliged to make it strong enough to keep his neighbours out, and so to contrive it that it would aid him in doing them all the harm in his power if they came too near. It is true the conditions are somewhat altered; the Act is intended to prevent a man from doing harm to his neighbours by his building; but it is still the neighbours whose existence renders it necessary legally to control the construction of buildings.

The harm which a man may do to his neighbours (including under the term the general public, the dwellers and owners near him, and the inmates of his own house) by the faulty erection of a building may be divided as follows:—

1. He may build so badly, or so neglect to maintain, that the building may fall down. Security must, therefore, be insured.

2. He may build so that his premises may be liable to catch fire, and to communicate fire to the adjoining premises. *Protection against fire* must, therefore, be insured.

3. He may grievously annoy his next-door neighbour by himself building in an unreasonable way, or by hindering his neighbour when he wants to build. Rights of adjoining owners must, therefore, be defined.

4. He may build a house that is thoroughly unhealthy.

5. He may interfere with his neighbour's enjoyment of the street in which they both stand.

6. He may cut off his neighbour's light and air. Out of these six ways of injuring a neighbour, the Building Act only deals fully with the first three; it touches briefly on the fourth, namely, sanitary regulation, but its companion Act, the Metropolis Management Act, mainly attends to that and the fifth regulation of frontage. The sixth, light and air, is amply, in fact too amply, provided for in other ways.

As the Building Act is our subject, the topics to-night will be all but exclusively those which it embraces, namely:—Structural security; protection against fire; rights of adjoining houses.

It is, of course, of great importance for you to know the state of the law as relates to the other points which I have named, but as that is chiefly dealt with by other enactments, it lies outside of to-night's limits.

After going through these three heads, I shall have to tell you something about exception to the general rules; and about the means provided for enforcing the observance of the law.

It is right to say that in the Act itself the provisions which relate to security against fire and to soundness of construction are not separated as I propose to separate them to-night, but the various enactments are a good deal intermixed. Upon any system we should, in examining the Act, have to refer, first to one section and then to another, and the method I have selected, that of separating the enactments, according to the purposes which they are intended, will not, I think, occasion more of this inconvenience than any other method.

Structural Security.—This was not, I believe, the object contemplated by the Legislature when enactments were first made about London buildings. The Fire of London first gave occasion to legislation; and precautions against fire were the subject of enactment as early as Charles II.'s reign. Structural security is, however, a feature of the Act which is now law, and which was passed in August, 1855, that is to say, a little more than twenty years ago. Considerable pains are there taken to secure that buildings, or more properly the walls of buildings, shall be solid enough not to fall down. The Act does not attempt to secure that degree of general solidity and excellence which any person for whom a building is erected ought to secure for himself by the employment of a competent architect, and it gives only an indirect control over the construction of roofs, floors, or partitions, so far as relates to their structural stability.

The structural regulations with regard to walls are mainly to be found in the twelfth, thirteenth, and fifteenth sections of the Act, and in a schedule of rules appended thereto. The foundations are to be solid ground, concrete, or other solid substructure. The footings are to be of a certain height and width. The materials allowed are brick or stone, or other hard or incombustible substance; these materials are to be solidly put together, and properly bonded. Mortar or cement is to be used, the courses are to be horizontal (or if not the wall is to be one-third thicker than otherwise). No portion of a wall may overhang, and the thicknesses of the external or party walls of a building are determined by certain tables.

External and party walls may have recesses in them, but only to a certain extent, and with a certain thickness of back. External walls may have openings. Party-walls may have chases in them, but not so large or so placed as to weaken the wall. Bond timbers must not be built into any party-wall. Bressummers must be suitably supported, and neither they nor any other tim-

bers must be built in within half a brick of the centre line of a party wall.

By far the most important of these regulations are those which fix the thicknesses of walls. They appear on the whole to be very sensible, practical, and satisfactory building rules. I have found them of service in enabling me to determine what was a reasonable thickness for walls in buildings out of London, and though there are circumstances in which it is desirable to make walls thicker than the Act requires, especially in the upper stories of dwelling-houses, the rules will be found in almost every case to give a minimum which is sufficient for security, and the cases in which the legal thickness could be safely reduced are very few indeed.

The thickness of walls is regulated in the tables, by their length, their height, and the height of the stories they enclose, and for this purpose buildings are divided into two classes,—the warehouse class and the dwelling-house class.

The warehouse class includes buildings intended for use as warehouses, manufactories, breweries, and distilleries; here the weights with which the floors are liable to be loaded are heavy, and the clear spaces are frequently large, and, consequently, thick walls are required. Other buildings fall into the dwelling-house class; the walls of these are less thick, for the obvious reasons that the weights are expected to be less, and the points of intermediate support more numerous.

The height of a wall for the purposes of this measurement is the height from its base, that is, the course above the footings, to the top of the topmost story; this, by the bye, in cases where there are stories in the roof, may be a greater height than the actual height of the brickwork.

The length of the wall is measured from the centre line of one return-wall to the centre line of another; the return-walls available for this purpose being either external walls, or party walls, or what are termed cross walls, that is to say, internal walls of a sufficient height and substance.

Let us see how these regulations are applied.

Suppose, for instance, the distance from the base of a front wall of a house which I wish to build to the ceiling of the top story was between 50 ft. and 60 ft., and I want to know the proper thickness for that wall, there being no cross wall, and the length from centre to centre of the return walls, at the two ends of the front, being more than 30 ft., and less than 50 ft. On referring to the table, I find that I must have two stories of two bricks, and the remainder of one brick and a half. Had the length been greater than 50 ft., the rule for the same height would have been—one story, two bricks and a half; two stories, two bricks; remainder one and a half. Had the wall, however, been buttressed by an internal wall sufficiently thick and high to merit the name of a cross wall, and so placed as to divide the main wall into two pieces, each less than 30 ft., the wall in question need only have been two bricks for one story of its height, and a brick and a half for the remainder.

For a building of the same height of the warehouse class, the rules would have required, in each case, a somewhat greater thickness.

Most editions of the Building Act include a diagram of the various heights and thicknesses, provided for in the table, and this diagram is generally employed, and, as far as I have tested, it is correct; but it should not be forgotten that it has no authority, the authoritative rules being the tables of lengths and heights and consequent thicknesses appended to the Act.

There is room for one or two miscellaneous observations upon this head. There is a general rule that no story of a dwelling-house is to be built with walls less than 1-16th of its height in thickness, and no story of a warehouse less than 1-14th of its height; and if, owing to unusually lofty stories or otherwise, the ordinary rules would bring this about, the wall in question must be thickened (or fortified by piers). Secondly, if two walls are not more than 25 ft. from centre to centre, and are tied together between the ground-floors and the roof by the beams of one or more floors, their length is not to be taken into account in computing their thickness, but the intermediate floor-tie gives them sufficient steadiness to permit its being disregarded, and their thickness is to be computed as though they were under 30 ft. long. This rule often acts beneficially to the builders of schools. A cross wall, to be of use in limiting the length of the wall to which it is joined, must be at least two-thirds as high as the external or party wall, and two-thirds as stout as such a wall of the same dimensions. No story of a dwelling-house more than 10 ft. is to be enclosed by 9-in. walls.

In practice these rules are generally easy of definite application. They often render it necessary to thicken old walls when a building is partially rebuilt, and they occasionally lead to other difficulties, but, on the whole, they leave but little to be desired.

The next series of regulations affecting security form a distinct part of the Act,—the second part relating to dangerous structures.

If any building, or part of a building, or thing affixed to or projecting from a building, is considered dangerous, and a notification is sent to the Metropolitan Board of Works to that effect, they employ the district surveyor to examine and report upon it. If he reports that this structure is dangerous, the Board issues a notice to the owner to pull down or otherwise secure what is dangerous, and proceeds to get that notice legally enforced, if it be not attended to. This, of course, ordinarily refers to buildings which have been allowed to fall into decay, or in some other way are neglected.

The sort of danger contemplated is danger from human life by accident, and a building, however insalubrious or out-at-elbows, is only dangerous in this sense if part of it is in danger of falling down or breaking down. Here, therefore, the Act provides for those cases of neglect which from time to time arise, and sometimes for the result of faults of construction which it is powerless to prevent. Here also is a power which, under exceptional circumstances, might be brought to bear upon parts of a structure which are not in any other way subject to the Building Act. For example, I can imagine the case of a floor in a roof, so flagrantly ill constructed that the district surveyor might feel bound to put in action the machinery of the Act, and to cause a notice to be served upon the builder to take it down, though he is not empowered to prevent its being put up. But such cases are necessarily of infrequent occurrence.

The dangerous structures ordinarily found are old walls and chimneys out of the perpendicular, and in half the cases that occur the failure is traceable to the vicious habit that once prevailed largely of building bond timbers and timber plates into walls. This decays, the brickwork collapses as the timber disappears into pulp, and the ruin of the wall is the result.

I now come to the second part of my subject, the provisions intended to prevent the spread of fire. These we meet with throughout the whole of the first part of the Act, that part which relates to the construction and supervision of buildings; and if you become familiar with the mode in which fires originate and spread in a building, you will recognise that many apparently capricious provisions of the Act are really precautions of greater or less value against some part of the risk of conflagration.

Where do fires originate? Setting aside, of course, the causes which have nothing to do with the structure, such as lucifer matches, reading in bed, or escapes of gas, the cause is ordinarily to be found where it is a structural one, in the fire-place or the flue.

Timber exposed for a length of time to heat eventually becomes so inflammable as to burn readily, and many fires are due to timber in or close to a flue, or under a hearth, or adjoining the back of a fire in the next house, to flame from burning soot finding its way through crevices in the flue, and to heating apparatus, stoves, and stove-pipes too near woodwork. We have, accordingly, a long series of rules, chiefly occupying the 20th and 21st sections, which regulate chimneys and flues, and, the general effect of which is to introduce safeguards against these sources of danger. They are minute and precise, and here, as elsewhere, I shall only give you their general scope.

The fireplace and chimney can only be corbelled out when above the ground-floor, and then only to a certain extent. There must be a hearth to each fire-opening, with stone or iron bearers to brick trimmers, except it be on the ground-floor; the fire-opening must have an iron chimney-bar and a back, 9 in. thick at least if in party wall. The enclosure of a flue must be at least half a brick thick, and pargetted inside and on the outer face; where it slopes more than 45 degress, its top must be a brick thick, and every flat flue must have soot-doors. A chimney may not be built against an existing party-wall, unless a proper wyth (or back) half a brick thick be secured thereto; once built, it may not be removed, except on certificate of the district surveyor, and it may not be cut into except for certain specified purposes. The floor under, and for 18 in. round every manufacturing oven or stove, is to be incombustible.

The rules as to keeping timber away from flues are stringent. No timber or woodwork is to be introduced into any wall chimney-breast nearer than 12 in., to inside of a flue or under a hearth within 18 in. of the upper surface, nor to come within 2 in. of the face of the brickwork or stonework of a flue, unless that face be rendered, or the walls of the flue be a brick thick. No wooden plugs are to be driven nearer than 6 in. to the inside of any flue or chimney-opening, no iron hold-fast nearer than 2 in. No pipe for conveying hot-air or steam may be fixed nearer than 6 in. to combustible materials, or if it convey hot-water alone, than 3 in., under a penalty of 20*l*.

Curiously enough, though the Chimney-sweep Act, which it has been lately attempted to revive, provides that it shall be illegal to build a flue less than 14 in. by 9 in.,—this regulation is not in force in London, and there is no legal size for a London flue. This is probably no loss, but it is possible that some of the enactments about the thickness of walls of a flue, and its construction generally, might with advantage be much more stringent.

Secondly, when a fire occurs, how does it spread? If it is inclosed between brick walls it rarely spreads through them, but if there be even one opening in a wall, it readily bursts through it. It runs out of the window openings in long tongues of flame, which are blown along the surface of the wall and set light to anything they catch. It comes out of the roof, and especially out of any skylight or dormer or projection, and it shoots along the roof, and if it can reach any woodwork it sets it in a blaze. We shall find another series of enactments occupying from the 14th to the 19th sections, directed as safeguards against this evil, and intended to impede the spread of fire. First, there is the general rule that all buildings shall be inclosed by walls of incombustible materials, and following are the rules that the back of a recess in a party wall is not to be less than a brick and a-half thick; that there are to be no openings in party walls except where the two buildings on each side of the wall are entirely in the same occupation; and that separate sets of rooms must, under certain circumstances, be separated by fire-proof floors. These rules all tend to inclose the fire within the brick walls.*

THE BIRMINGHAM IMPROVEMENT SCHEME.

A LOCAL Government Board inquiry was held on the 16th and 17th inst. at Birmingham, relative to the proposed borough improvements scheme. This is the first inquiry under the Artisans' Dwellings Act. The Mayor appeared on behalf of the Corporation, and said that notices had been served on 1,446 occupiers of property, and and there were 324 dissentients. The total area to be dealt with was 93 acres, the population about 18,000, and houses about 4,000. All the evils which arose from overcrowding elsewhere existed, and dwellings abutted upon privies and other abominations. Of the 3,351 houses in the unhealthy area, 2,258 were built back to back. The death-rate varied from 28 to 97 per thousand per annum, the normal death-rate for Birmingham in healthy times being about 22. The majority of the houses at present were rude tenements, let at rents varying from 2s. 6d. to 5s. per week, and the Council anticipated supplying much better houses at 6d. or 1s. more. A number of witnesses were examined in support of the scheme, and the inquiry was adjourned.

The Windsor Drainage.—The Drainage Committee of the Windsor Sanitary Authority have further considered the tenders for the construction of precipitating tanks, engine-house, sewers, dwelling-house, and other works at the Ham, Old Windsor. Mr. Prout, of London, whose tender for 7,900*l*. was the lowest, has withdrawn, as he has discovered that he has made an error in his calculation. The tender next above Mr. Prout's was that of Mr. Acock, the contractor for the works in progress, for 11,500*l*., and this has been provisionally accepted. The other tenders were Mr. Chamberlain, London, 13,700*l*., and Mr. Dickinson, of Oxford, 12,200*l*.

* To be continued.

BOGNOR WATERWORKS.

THE town of Bognor is rising rapidly into importance. It is a clean, pleasant watering-place, with some shingle and some sand; and it maintains, by a long line of defensive works, a somewhat precarious footing against the advances of the sea. The stranger who first visits Bognor beach cannot fail to be struck with the formidable stockade of groynes, and the infinite variety of slopes and materials employed in the construction of the esplanade walls; and he may also employ half an hour profitably in studying the varied ingenuity that has been displayed in sundry combinations of paving, pile-driving, and fascining, which in the result seems neither efficient nor ornamental.

Still, the beach is very popular in the summer time; and Bognor continues to grow and to flourish, for there is a fine bracing air, and clear open sea, and a pier with a band upon it in the evening; and, except in the Goodwood week, good accommodation can usually be obtained at fair prices.

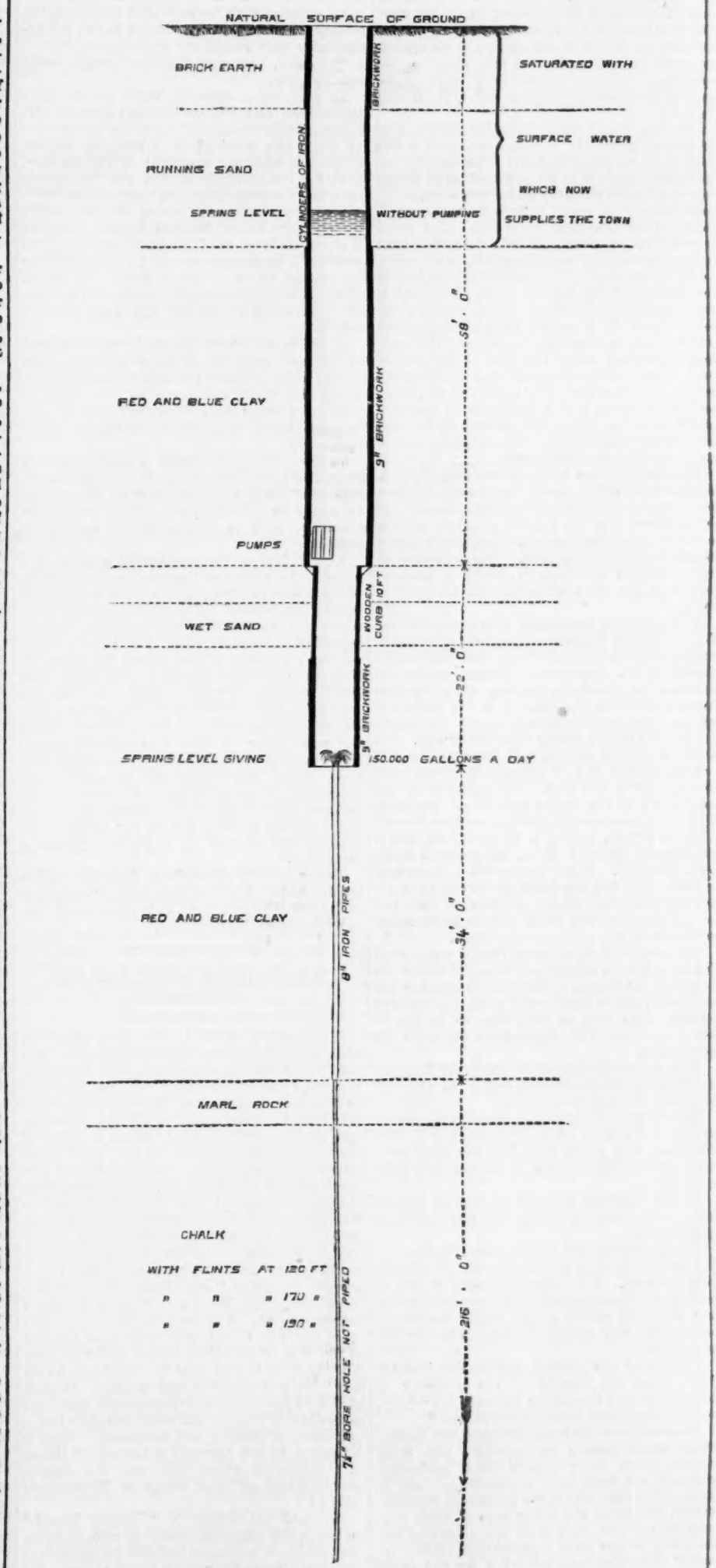
But Bognor, in spite of an active Local Board, is without proper drainage or water supply. The visitor on the beach is offended by smells (now, happily, in process of removal), and in his apartments may be equally astonished at the inspection of his water-bottle. A Local Water Works Company has been formed amongst the principal inhabitants of the town, and, as the works are now in a fair state of progress, a short account of them may not be uninteresting, because they form a fair example of the kind of small waterworks which might be profitably and advantageously carried out in many of our smaller towns by private enterprise.

The first provisional order from the Board of Trade was obtained in 1871, but, as is often the case in such matters, there was delay, and nothing was done till 1874, when the well was sunk. A section of this is appended, and shows the various strata passed through. The first 58 ft. passes through brick earth, running sand, and red and blue clay. Then come more wet sands, and red and blue London clays, down to 114 ft. from the top, where the chalk begins, having upon it a thin bed of marsh rock. The chalk is entered by an artesian boring, 216 ft., making a total depth of 330 ft. At this depth a fine chalk spring was struck, for the water rose nearly to the top of the well when the pumps were not at work, and when they were the water-level was brought down to 80 ft. from the surface, at which level the spring maintained itself at a yield of about 150,000 gallons in the twenty-four hours, being considerably more than could be required for the town. At this point the thickness of the great chalk-bed is probably 850 ft. or thereabouts, and the finding of so fine a body of water near the surface was satisfactory, because only a few miles off northward a deep well was sunk entirely through the chalk, and affording a poor supply. At Worthing, however, which is considerably further off, but, relatively to the sea, more similarly situated, the results of well-sinking appear to correspond with those at Bognor.

In sinking for water in chalk on the south coast it is found that the supply generally comes out of fissures, and it then rises to the level of saturation of the district. In sinking, at Bognor, so close to the sea, the most formidable risk would be that some connexion might exist between the spring and the sea. Such would, if it existed, be manifest in the well's water level, which would vary with the tides. It may, however, even in such a case, be generally assumed that where there is hilly country in the district, the inland or spring fresh waters will, at most seasons of the year, overpower the salt seawater by their superior pressure. In very dry weather the flow may be inwards, and render the springs brackish.

In a work of this character too great care cannot be taken to exclude all water except that which comes from the bottom of the bore-hole itself, in wells passing through clays of the Lower Eocene Formation, known as "London" clays. This is particularly necessary, because those clays have wet beds of impure water, which has an offensive smell, and is full of organic matter, and this water, getting into the well, destroys its purity. As a rule, wells are sunk without proper supervision and without proper design or study.

The well at Bognor has a 6 ft. diameter shaft, made of brickwork, 9 in. thick, set in cement for a depth of 58 ft. Below this for 22 ft. the shaft is reduced to 4 ft. 6 in. diameter. Wherever wet sand is passed through, iron cylinders are used;



Bognor Waterworks.—Section of Well.

and as the lower portion of the well is found to admit external water, a cylinder, 3 ft. diameter, and 22 ft. long, is to be placed in it, and over the bore-hole, and surrounded with concrete, the success of the whole enterprise depending as much on the purity of the water as its quantity. Water derived from deep chalk springs is certain to be pure water, but it may be hard.

Having found water in sufficient quantity, it became necessary to create a reservoir at a high level to pump it into. The country immediately adjacent is all one dead level, affording no elevated site whereon to erect a reservoir: consequently a tower had to be constructed, having a cast-iron tank at the top. This tower is now very far advanced towards completion; it is square on plan, measuring 25 ft. on each side, and is of brickwork; the height from the floor to the bottom of the tank is 42 ft. The tank is supported on brick arches. In the centre of the tower there is a square brick chimney-shaft which passes up through the centre of the tank, and whose cap forms the apex of the pointed roof which covers the tank and protects the water from sunshine. The tank is 25 ft. square and 10 ft. deep, and is composed of cast-iron plates bolted together; it is also tied across with tie-rods of wrought-iron. The chimney-shaft is also lined with cast-iron plates.

The design of the tower is ornamental; it is pierced with Gothic arches, faced with coloured bricks, and it is divided up into three floors. At the top there is to be a small staircase outside and door for access into the tank, which has a capacity of 37,500 gallons. This quantity of water will be sufficient to afford a constant service to the town when the engine is not at work.

The pumping machinery is to consist of one 7-h.p. upright direct-acting overhead cylinder engine of the Britannia pattern, made by Messrs. Grover & Co. (Limited). In this engine the cylinder is placed on the top of a cast-iron frame resembling the letter A, at the bottom of which, close to the ground, comes the crank-shaft. The engine stands close to the well. The shaft is carried over it, and connects by two cranks to two sets of pump-rods, which work directly down the well. The cylinder of the engine is 1 ft. 6 in. stroke and 9½ in. diameter. The pumps consist of a pair of combined lift and plunger pumps, having a 10 in. stroke, and a diameter of barrel of 5⅞ in., the plungers being 4 in. diameter. These pumps are independent of each other, but are connected to cranks which are placed at right angles, so that on both the up and down strokes there will be a continual discharge of water and no dead point.

The lift and plunger pump throws equally on the up and down stroke, and is useful where the height of the column of water to be raised is not excessive; where that is very great it is better to employ some kind of lift-pump, so as not to bring any excessive compressive force on the pump-rods.

The pumps for these water-works are designed to lift 100 gallons a minute, nearly, so as to fill the tank in about seven hours.

The boiler to be employed is a Cornish one, of rather large size, 14 ft. 6 in. long, 4 ft. 6 in. diameter, with a 2 ft. 8 in. flue, the shell to be ⅜ in. thick, and the flue $\frac{7}{16}$ in., the ends to be ½ in. thick.

It was originally intended to have an upright boiler with internal tubes, but this has been superseded.

The situation of the water-tower is convenient: it immediately faces the traveller on his entrance into the town. The grounds around it will be laid out with ornamental gardens and shrubberies, and beside it stands a now nearly completed, substantial, and sightly dwelling-house for the engine-man.

The cost of the present undertaking is about 6,000*l.*, but the capital of the company is 10,000*l.* to meet increasing demands for supply, and the shares are taken up in the locality.

Waterworks divide themselves into two classes: those which depend on pumping, and those which derive their supply from gathering-grounds and have large storage reservoirs. It is manifest that only a few situations, comparatively, will allow the latter type of work to be carried out, and even then the great first cost involved makes such undertakings rather the work of corporations labouring for the public good, than of local shareholders seeking dividends as well as pure water. Still, gravitation schemes are correct in principle, and everywhere to be preferred.

It may be taken as a "rough and ready" principle that from 2*l.* to 3*l.* a head of the population supplied may be expended on a pumping scheme; whereas, in gravitation works, the expenditure may reach, and even double, that,—in all cases, assuming that the district really needs supply.

In gravitation schemes, there are so many landowners' and millers' interests affected, that it is a formidable undertaking to run the gauntlet of them all; whereas, in a pumping project, there is a tolerable command of the country, both for the pumping station and the service reservoir: consequently, the same difficulties do not occur. For small towns in the highly civilised agricultural South of England, pumping is alone possible; but it is often worth while to consider if assistance cannot be obtained from the natural forces in air or water. At Faversham, in Kent, the pumping machinery is sometimes driven by a windmill, and much economy results.

At Bridgend (where the works were designed by the same engineer as those at Bognor), the spring, which is nearly two miles below the town, is dammed back, and made to lift itself by means of a water-wheel the entire distance, and to a considerable height above the town, into the reservoirs.

On the other hand, where a steam-engine is erected for pumping purposes, if it be, as it ought, capable of doing two days' work in one, its services may be valuably employed in some other operation, such as stone-breaking, sawing, or grinding.

A good deal of the commercial success of a waterworks enterprise depends on the situation of the houses relatively no less than on the tastes of their inhabitants. A straggling country town, where the houses have large gardens, and are separated from each other, stands at a disadvantage; whereas, a town where the houses by time have got well together, and jostle each other, will pay for water supply, and feels the need of it more, although it may perhaps have the same surface supply as its neighbour. Towns having an influx of visitors at different seasons stand more in need of efficient water supply than those whose populations are permanent and sedentary. Above all things in a constant-service and pumping project, it is necessary carefully to guard against waste either in the mains or the fittings, and to keep up a vigilant system of inspection.

The contract for the works at Bognor was taken by Mr. Arthur Smith of that town, the engineer to the company being Mr. J. W. Grover, of Victoria-chambers, Westminster.

WESTMINSTER ABBEY AND ITS MEMORIES.

IN MEMORIAM.

WESTMINSTER ABBEY! We have often and often wondered at how little attention has been paid to the *changes* which have, since its foundation, been perpetually going on in and about this so deeply-venerated place. What a history would it tell, could it but speak, of all that is strange and curious, and notable! What a series of chances and changes have the very walls themselves undergone, and been witness to, and how much has the very ground round and about them changed in aspect! No "old inhabitant" of Westminster could now possibly recognise it, or could know his way about without a special guide. We may yet, by dint of curious looking at old prints and written memoranda, get a glimpse, imperfect though it may be, of what it looked like in any bygone century, so that all is not wholly lost. And we may even people the place again in its old way, and get at a notion of how they of that time looked and what they did. But this is, and must be, all of it, but very imperfect, and shadowy, and dreamy. It must be always difficult to transport oneself into a bygone state of things, and most certainly into a past state of feeling and sentiment. What a difference, to wit, between the aspect of things in the days of Abbot Islip and the present guardian and guide of things in Westminster Abbey!

We need not dream of "Thorney Island," on which the venerable Abbey is said, in legendary story, to have been founded, nor go back to that older Pagan time which lasted so long. But it would be interesting, were it possible to do so, to get a notion of the church which stood here before King Henry III. pulled it down, and enlarged the plan of this ancient Abbey. Not only did he do this, as we now find, but he added chapels to it, and made it, indeed, what it now is, with the exception of the towers, and the chapel built by Henry VII.—not, by the way, the least portion of the building. The date of that building may be usefully noted: the first stone of it was laid on the 24th of January, 1502. King Henry designed it as a burying-place for himself and his successors, expressly enjoining by his will that none but those of the blood-royal should be inhumed in it. It is, indeed, as a place of sepulture for the illustrious dead that this old Abbey Church is of so much, and of such all-enduring, interest. The place is right full of the dim forms and memories of those who have gone before us in life's race, in so many remarkable ways.

It is, therefore, in this light that we would now look at it and think about it, and there is surely matter enough and even to spare for it, for the "monuments" of the Abbey are not a little startling in very many ways. It is hard to know where to begin, for the whole church is full of them on floor and walls. They are in nave and transepts, and well-nigh fill a multitude of "chapels." These chapels, at the east end of the cathedral, are in themselves not a little curious. These chapels retain their ancient names, — St. Benedict's, St. Edmund's, St. Nicholas's, Henry VII.'s Chapel, St. John's, the Chapel of Islip, otherwise St. John the Baptist's, and the Chapel of St. John the Evangelist, the Chapel of St. Andrew, and that of St. Michael.

In the chapel of St. Benedict there is, as the guide-book tells us, an "ancient tomb of stone," with formerly a canopy of wood, and on it lies the effigy of Archbishop Langham, monk, prior, and abbot of this Abbey, afterwards bishop of Ely, and then Primate and Chancellor of England, and a Cardinal Bishop and Papal Nuncio,—a great man in his day. He died on the Feast of St. Mary Magdalen, in the year of grace 1376, and on whose soul, says his epitaph, "May God have mercy." A notable man in his own day, and doubtless did he officiate many times in this very chapel of St. Benedict, and before the altar of it, which stood at the east end of the chapel. The space of it is now occupied by a monument to the memory of Lady Frances, Countess of Hertford, who died in 1598. There is here also the tomb of Dean Goodman, the fifth dean of Westminster, who presided over the Abbey "for forty years," with much applause,—a man of regular and devout life. He died in 1601. There is here, too, Dr. William Bill, also a dean of Westminster, and master of Eton College, and of Trinity in Cambridge, and chief almoner to Queen Elizabeth. He died in 1361. A good and learned man, says his epitaph, and a "friend to those that were so." Others are here buried of equal renown, so that this small chapel is full, as we have said, of memories, and is, indeed, typical of the whole Abbey. If the reader stays long enough in it, or by the side of it, much of the past may come before him.

We might thus go through these many shrines, filled with so many and varied matters for thought, but must forbear, for every chapel is full,—too full, some might think,—of "memorials"! But the one thought and impression that all must needs get from a visit to Westminster Abbey is that it is now, above all, a place of sepulture for the illustrious dead, with memorials of them, and with "inscriptions" more or less descriptive of them. Forms of faith may, and do, change, but this desire to perpetuate the memory of those who have preceded us in life's race must always be, and can never fail. It is the same yesterday, to-day, and for ever. It was so yesterday, and it was so in the days of King Sebert, king and ruler over the East Saxons, in the seventh century; also of his Queen, Athelgoda, a long time back. This takes us to the very first-known thing respecting this Abbey of Westminster. George II. was the last king buried here. In all, thirteen English sovereigns have found a final resting-place in Westminster Abbey. We might well, as we have said, go through all these chapels, and take note of those who have been buried in them, and it is difficult to stop, or to know well whose memorial to pause before and take note of, and which to pass by. There are many "nameless" graves,—graves of men of mark in their own day, or they would not be here, but now forgotten,—even their very names worn away from the stones which cover them!

In these chapels, so lone and still now, and with the "dust of antiquity" yet on them (thanks to Sir G. Scott, they are not being restored), there are many, many tombs of men equally

remarkable, their names alone full of meaning. John of Eltham, son of Edward II., and the children of Edward III. Churchmen are here also. We are now in the Chapel of St. Edmund. There is Monck, bishop of Hereford, and Ferne, bishop of Chester, and these men may have not unfrequently officiated in this very chapel. Some altar-tombs are here, as that of Edward Talbot, eighth Earl of Shrewsbury, with his lady, Jane. Much might be here said of the art aspect of these memorials, looking at the past and present of memorial architecture and sculpture. It might be usefully asked, are we progressing, and doing better and better things? If there are those who are curious in such matters, here is the place for them to study in, for there are all kinds and degrees of workmanship, from the primitive "hand-work" of the old artist-workman to the "art-manufacture" of to-day. Great lessons in stone and marble cutting.

We must needs leave our notes of the northern chapels, and of the nave and aisles, and call but a moment's attention to the imposing "tombs" in the north transept, for these truly form a contrast to those early and more humble "memorials." Some of them are finely executed, and as works of art and sculpture are notable; but they positively crush the Abbey, and dwarf it. There is Lord Mansfield's ponderous tomb. Lord Mansfield was a great man in his day, and died, as the guide tells us, full of years and honours, and from the love he bore to the place where he now finally rests, he desired to be buried "privately" in it. He would himself most certainly have forbidden the putting up of so huge and conspicuous a monument to his memory. It was through an accident more than anything else that this was done. Flaxman was the sculptor, and the face of the great judge is very finely executed. At the north end is William Pitt, speaking to the "House,"—a clever and a well-executed thought of Bacon, the sculptor of it, but the ponderous basement on which it stands all but spoils it. Many others there are here, and some good work may be seen in parts in and about them, and it seems almost a pity that some at least of these ponderous "basements," which answer no useful purpose, cannot be put aside. The true "memorials" would then be far more impressive than they now are. Very much more might be said, and really needs to be said. Here again does our art-manufacture come in, and there is right plenty of it.

We can but take a parting look into the Chapel of Henry VII. It seems hardly possible to do otherwise than to dwell, if but for a moment, on its merits as a work of art and architecture. The "phase" of Gothic in which it is built has been a little slighted, the earlier styles which preceded it having the sway. But it is well worth attentive study. It is, in sober and unprejudiced fact, a finished work of art and architecture, and is full of inventive power and refinement of design and art workmanship, and is to the full worthy of the great building of which it forms a part. In it is the magnificent tomb of its builder, Henry VII. and his Queen; and there now, close by, reposes in final rest a woman and lady, second most surely to none whose mortal remains are here. Of her it might truly be said, that her right hand knew not of that which her left hand did; and, what is, to our mind, more, time and repetition of kind and gracious acts did not weary her. Many, many are there who will do a good act once, or even twice, and then stop, but here it was not so. With life only did the Lady Augusta Stanley's charity cease! Let us hope one thing,—that if a "memorial" or monument be built up to her memory, it will be an art work, in that one and only way in which real art work is possible, one wrought by the very hand of the sculptor. It would be hard, nay, impossible, to find a subject more worthy of his art.

Test for Arsenical Room-papers.—Professor Hodges, writing to an Irish contemporary, says it is merely necessary to place a piece of the suspected paper,—about the size of a penny-piece will be enough,—on a saucer, and to pour over it about half a teaspoonful of the solution of ammonia. If any of the arsenical green be present, the solution in a few seconds will become of a rich blue colour, and if, on placing a bit of lunar caustic (nitrate of silver) about the size of a pea in the solution, a yellow ring or crust of yellow arsenite of silver forms round the caustic, the presence of the poison may be regarded as certain.

AN OLD GATE-PIER.

MOST passers-by would probably have wondered what there was in it to attract special attention or elicit a loving admiration. There was no want of other attraction for the eye and mind in the perspective of a beautifully-wooded undulating landscape on one of those cold and misty, yet bright, mornings when one gets the first hint that spring is going to supersede winter; and certainly the prospect had none the less of charm for that peculiar quiet in the air which seems to mark the English Sunday, even far out in the country, not less than in the neighbourhood of town. However it may be explained, the fact was, that the old gate-pier in question was the feature which most pleasantly struck the eye of a rambler from town on the particular bright morning referred to.

The gates were nothing in particular, to be sure; and perhaps it was the contrast with their style and associations which the more emphasised the very different suggestions of their surroundings. They were, in fact, what may be termed, with reference to style and character rather than topographical origin, "Brummagem." They were of ostentatious and pronouncedly florid design, and resplendent in the bright blue, chocolate, and gilding by which metal-work of this school is usually recommended to the discerning eye. Through their painted twistings one looked down a lawn, terminated by a respectable-looking square mansion of no particular style or character; the sleepy repose of which, with all the blinds down, contrasted oddly with the "all-alive" look of the gates. But the brick pier which formed the framework of the picture on each hand, and to which these self-asserting gates were hung, was, in fact, a picture by itself, and quite threw into the shade, to the eye of artist or architect, either gates, house, or lawn.

As a matter of association, there is a good deal of interest in an old domestic gateway. It is the connexion between the public and private domain, the architectural feature which belongs equally to both, and commonly suggests, or should suggest, to the outside passenger the architectural character and treatment of the house itself. It conveys reminiscences of all the various generations, residents and visitors, who have passed its advanced guard in entering the family house, or turned to look at it, as a last glimpse of the place, in leaving. In the present case, however, it was not merely this sentimental interest that struck the casual observer; but an architectural and artistic suggestiveness. It was merely a plain brick pier, with a brick plinth and a by no means elaborate square stone capping, dating probably from the reign of good Queen Anne,—who has unexpectedly given in these latter days a name to a style,—or perhaps not quite so far back. At all events, the brickwork was of that kind which it does the eye good to see, considered either constructively or artistically. The bricks were smaller,—that is, thinner and flatter than at present used, and of a rich red tint, which, in combination with weather stains, and the slight greens and greys of moss and lichen here and there, made the whole such a beautiful combination of colour, warm and cool, as any artist might justifiably have spent some trouble in reproducing as a study of effect. The tints, owing to natural influences, however, did not predominate much over the original tone of the brickwork, which may have been mellowed by time a little, but which, at least, showed that, at the date when it was built, it was possible to get a brick of really fine colour and smooth close texture, far superior in finish of appearance to the best stock brick of the present day, and equally superior in depth and richness of tone to our modern smoothed-out "patent compressed" brick, and which was dependent on no artificial colouring or touching up. And the question is, why cannot we have such a brick now? If an architect wants something beyond ordinary brickwork in the present day, and scorns the wretched and perishable expedient of applied colouring, whereby all tone and surface texture that the brick may have are defaced; if he chooses to think, moreover, that a thinner brick than the normal size has a better appearance, and makes better work; he cannot get what he wants. He must take the size the trade choose to give him, and he must choose between bricks of no colour or tone at all, or the raw effect of applied colour, by which brickwork is reduced practically to the level of cement. Yet, if such beautiful bricks as these of our old gate-pier were made then, why cannot they be made now?

There is something in the absolute solidity of the workmanship which also attracts our respectful attention. Our old pier seems likely to outlast the new wall which has been built to flank it, and which is a fair specimen of modern brickwork. Its lines and joints are as true as when first built. It is not improbable, certainly, that originally it was tuck-pointed, and time has gradually and quietly removed this one defective and perishable element in its structure, and left the thin clean-run joints with that line of dark shadow which adds so much to the appearance of the whole, and which proprietors of old buildings of this date seem often so ready to destroy by the unnecessary process of re-pointing. The excessive development of pointing was the one defect in the brickwork of the period to which our pier belongs, which of course the revivers of it are blindly and inconsiderately copying, producing buildings which are all a network of crossed white lines; the characteristic effect of which, even if it be of any value at all, is impaired as soon as the mortar begins first to lose its colour, and then gradually to drop off, as it infallibly will. Independently of that, however, there is this about the period which our gate-pier represents, that it was a time when, as our pier stands in evidence, those who paid for good, solid, honest, durable work could get it. Such work is at least very hard to come at now, in days when a workman thinks only how he can get the highest wages for the least labour, and a contractor too often is occupied in considering how far he can make bad and cheap materials do the work of good ones; days when, as a well-known modern philosopher is reported to have said, in his characteristic, caustic manner, a man thinks nothing of "breaking the whole of the Ten Commandments with every stroke of his hammer." Under such an evil condition of things, there are, perhaps, some lessons not only architectural, but practical and moral, to be learned from an old brick gate-pier.

THE GALE AND THE TELEGRAPH WIRES.

THE recent heavy gales have wrought terrible havoc among the telegraph posts and wires, and made more evident a danger to travellers in the streets to which we have before now alluded. Not only in London, but in most of the large cities and towns of the country, many miles of wire—to be measured, indeed, by hundreds of miles,—are suspended from posts and chimney stacks on the tops of houses; the state of tension to which these wires are strung is evident from the exceedingly slight curve which they make between each post, and in many instances a number of them, from ten to a dozen and more, are strung across the most crowded thoroughfares. The resistence which such a row of wires, many of them an inch in diameter, must offer to the wind is immense, and the strain placed upon them and their supports is very severe. Sir John Hawkshaw, in a timely letter to the *Times*, points out that these wires, exposed to the action of the smoky, foggy atmosphere of a town like London, are liable to rapid decay; and this is more particularly the case at those parts which, by their position, as when twisted round the posts, or otherwise fixed, are apt to retain the water in rainy weather, and the rust and filth when it is fine. But telegraph wires are not accessible to periodical inspection, and as they are subjected to no ordinary mechanical wear and tear, they are likely to be overlooked.

Three accidents, one attended with fatal results, in one city within twenty-four hours, show that the fears are not groundless; and the total destruction of a chimney in a thoroughfare like Cheapside, through the strain placed upon it by the telegraph wire during such heavy weather as we have experienced, shows that the dangers do not cease with the mere snapping of the wire. The sudden removal of the normal pressure on one side of a post or chimney is sufficient to cause the "pull" on the opposite side to become too great for it, and in this way a whole series of accidents might be set going along the whole length of the line.

After the warning of the past week it will be necessary for the Post-office authorities to take precautions for the prevention of such accidents for the future. It is, perhaps, inevitable that we have telegraph wires hung over our heads; for although many miles are laid underground with our sewers and gas and water pipes, the delay and expense of creating communication by this method would prevent its exclusive adoption. But at least we have a right to claim immunity from a death by hanging or decapitation.

SOME OLD HOUSES AND THEIR STORIES.

SIR ISAAC NEWTON'S HOUSE IN ST. MARTIN'S FIELDS.

IT is curious to note how the greatest masters in art, literature, and science arose to the dominant positions they seem destined ever to retain, when art, literature, and science were in the earliest stages of their infancy. The great philosophers, sculptors, and architects of ancient Greece, the great painters of Italy, the great poets and dramatists of the Elizabethan age, were giants amongst pigmies,—giants, mounted upon whose shoulders we often look contemptuously down to boast our more extensive prospect. There is to be noted, however, the fact that these wonderful men were of necessity creators, not imitators; and there is no doubt, as Sir Humphrey Davy once said, that imitation cramps the best energies of the mind.

In the earliest records of experimental science, amongst the little unintentional follies and earnestly childish absurdities of its few first efforts, stands another of these intellectually gigantic creatures, of whom it was with excuseable exaggeration written, as everybody knows,—

> "Nature and Nature's laws lay hid in night:
> God said, 'Let Newton be,' and all was light."

We have been looking upon the house in which the last portion of his life was spent. Our readers may look upon its resemblance. It still stands in an obscure and little used street running out from Leicester-square, adjoining one of the most interesting old places of worship in the country. The observatory Newton built upon its roof, shown in our sketch (from an old print), is no longer there, and the old porch has been removed, while the exterior of the building has an appearance of dilapidation and neglect drearily ominous of its too speedy departure.

The observatory was removed about nine or ten years ago, and was sold, we are told, to supply some new pews for the chapel next door! Newton once said the happiest hours in his life were passed in that observatory. In a day when people came from all parts of the world to see the place he loved in connexion with this his now neglected and almost-forgotten old house, it was associated with the chapel as a sunday school, and was carefully kept in repair for the inspection of visitors by the school committee. This was in 1824, before which time foreign philosophers had gone away from it mournful or indignant, and with no little contempt in their hearts for a nation which could suffer a relic of such national importance to fall into ruin and decay. What do they say of it, and of so many other old houses of ours, similarly interesting and important, now? Would Shakspeare's house be in existence if Americans had not threatened to preserve and remove it from England?

Let us bring Newton, the Shakspeare of science, from the dim past, and in our imagination briefly trace his life on its way to this quiet, old, seventeenth-century suburban dwelling.

We see him enjoying perfect tranquility and repose in a time of riot and turbulence, noble where all around are ignoble, pious when religion was laughable, unambitious, diffident, and retiring, with his pleasure at the mercy of no outer influences, and with his greatest wants supplied from within himself. When, as a famous lady of the period said, "the beasts of the field and the birds of the air are better company than the beau-monde," when vice was fashionable, and virtue scornfully regarded, and when even men of genius passed half their time growing excited, feverish, owlish, or quarrelsome in tavern parlours, he lived, separate and apart, a kind of dual life, at once in the world and out of it.

Even as a boy, said an old lady, Mrs. Vincent, who had known him familiarly at that time, Newton "was always a sober, silent, thinking lad, and was never known scarce to play with the boys abroad at their silly amusements, but would rather choose to be at home, even among the girls." When older, and sent by his mother to sell the produce of her land at Grantham market, a distance of five miles, and bring back certain commodities from that town to his quiet home, embosomed among the lonely hills of Woolsthorpe, he displayed the same characteristics. As soon as he and the servant who attended him arrived at the Saracen's Head in Westgate, Isaac generally left the market business to be transacted by the man, and retired to a garret belonging to Mr. Clarke, an apothecary, with whom he had previously lodged when at the Grantham Grammar School. There he plunged into the pages of certain old books, and, oblivious of the fleeting time, would emerge only when the trusty, old, indulgent servant who had known, and, perhaps, loved, his dead father, summoned him to commence their return journey. The books which attracted him were probably those he had taken delight in as a school boy, dear friends in shabby bindings, from which he parted in sorrow every Saturday afternoon, and rejoined with eagerness and pleasure every Saturday morning. When sent forth by his twice-widowed mother, Mrs. Smith, to look after the sheep or corn, or labourers, in the fields, he would be found under a tree or hedge, deaf to all extraneous sounds, blind to all extraneous sights, absorbed in the perplexing difficulties of some mathematical problem, or busy with his pocket-knife cutting wooden models to test mechanical theories, or down by the river-side constructing experimental mill-wheels. He was a great trouble to his poor mother, and we can imagine how in her deep distress she often went to her brother, the Rev. William Ayscough, of Burton Coggles, and asked him despairingly whatever she should or could do with that troublesome boy Isaac, who would not make himself useful, and yet was such a wonderfully clever fellow, who was so amiable and yet so unmanageable.

When his mother, acting upon the advice of her brothers and others, who saw the bent of young Isaac's natural inclinations, and gravely advised her to encourage them, sent him to college, he sat at the feet of the famous Dr. Isaac Barrow, "and spent," says Mr. Conduit, "the greatest part of his time in his closet." When he was tired with his severer studies of philosophy, his relief and amusement, we are told, were found neither in dissipation nor athletic sports, but in going to some other study, that of history, chronology, divinity, or chemistry, which had then hardly emerged from alchemy. A dreamy, quiet, genuine student-life, full of placid enjoyment, which estranged him from the rest of the collegians, at least as effectually then as it would now.

This power of abstracting his mind from outer surroundings never departed from him. In his later life he would often pause in the process of dressing after a night's rest, and become absorbed in the pursuit of some train of subtle reasoning, sitting for hours motionless, more or less unclothed, on the side of the bed, with his venerable white head bent, and his brows contracted over his downcast eyes, patiently following a fresh clue to some new truth, which should be a death-blow to some old error, or a stepping-stone on the way to ground still more advanced in wisdom. Often, in that old house of our sketch, was he repeatedly reminded of some forgotten frugal meal, which had long been waiting for him, the frequent neglect of which was seriously impairing his health.

In Cambridge commenced his wonderful career of greatness. There he became the scholar, Bachelor, and Master of Arts, was appointed senior Fellow, won,—although he did not wear,—the honour of the fellowship of law; and on Dr. Barrow's deserting philosophy for divinity, took his place as Lucasian professor of mathematics. There he made himself familiar with all the great philosophical writings then extant,—those of poor, unappreciated Descartes, of Kepler, Wallis, Oughtred, Van Schooten, and others. There he made himself perfectly master of all the different methods of calculation and research adopted by the greatest known geometricians and astronomers, wherewith he proceeded to verify or disprove the most valuable discoveries of past ages. Unearthing as he went better and more exhaustive experiments, whereby truth could be patiently and elaborately evolved from falsehood, he founded new systems of philosophy. Proceeding from effects to causes, and thence to new experiments developing other effects traceable to new causes, he thus made rapid and astonishing progress in fields which up to that time had been altogether unknown and undreamed of. What the Royal Society then was we have described in our article on its first house in Crane-court, still standing (see p. 32, *ante*). The readers of that paper will feel sure that its members could not long overlook the existence of a Newton amongst them. He was invited, with profound respect and reverence, to do honour to their meetings by his attendance.

To that Society,—be it never forgotten,—we owe it that Newton, diffident and retiring, and almost morbidly loth to court publicity for either himself or his discoveries, asserting that he was far too young to play the part of a reformer in philosophy, came forth into the light, whereby we see him, as without such inducements it is possible he might never have come. Hence became known those extraordinary truths involved in his communications on the methods of "fluxions," universal gravitation, and the properties and nature of light, discoveries of unexampled grandeur and importance, which, as M. Biot declares, he had conceived and soundly demonstrated before he had attained his twenty-fourth year. The chambers he occupied at Cambridge are said to have been next to the chief gate, and to have communicated with the observatory in the great tower, which was furnished by Newton, Cotes, and others.

In the library of the Royal Society is preserved the first complete reflecting telescope, which had so much to do with the evolvement of astronomy from astrology, labelled "Invented by Sir Isaac Newton, and made with his own hands, 1671." This instrument, which Newton regarded with contempt, was received in December—the month in which Newton had been born—and in the following January he was enthusiastically elected a member of the Society, not long after he had received its "solemn thanks" for the paper in which he had given an account of his investigations.

Newton's dread of public notice and love of quiet and solitude were intensified by the events which succeeded his being made conspicuous by the Royal Society. Envy-begotten controversy, of course, arose; but Newton's wonderful discoveries passed through that test of fire, and came forth unchanged and confirmed. His optical lectures, which Dr. Barrow had published for him, were desperately assailed. The curator of the Royal Society, Dr. Hooke, a man ingenious enough in some branches of mechanics, who was alike deformed in mind and body, was his bitter and violent antagonist. He denounced Mr. Newton's conclusions with ill-disguised contempt and anger. How dare this man from Cambridge assert that light was a compound of seven coloured rays with distinct properties, when he, the curator of the Royal Society, had previously and distinctly asserted that it was composed of only two, the violet and the red! Such impudence was unbearable. Then a man of real learning and ability, but one who, as many do, fashioned his facts to fit his theories, a French Jesuit, Father Pardies, who died in 1673, attacked Newton's discoveries. He argued positively that all the rays of light were equally refrangible! Then, again, a physician, with no conscience to speak of, and no scruples about the means whereby he attained his self-laudatory ends, Linus of Liége, actually asserted that the elongated image said to be produced by the prism was a mere fiction. He had himself often tried the experiment—as almost every schoolboy now does—and he had never been able to see anything more than a luminous spot perfectly round and perfectly colourless! Did he lie, or did he look through a hole, forgetting to put the prism in its place? He was polite enough, and sensible enough, to add that Newton was probably (how merrily the great English philosopher must have laughed) not purposely deceiving, but accidentally deceived, by—what, in the name of all that is nonsensical, do you think?—"some coloured cloud accidentally passing along the heavens!"

These, and many such things, duly made their appearance in the "Philosophical Transactions" published by the Royal Society, and were gravely read and considered by the members. Newton quietly smiled at their nonsense, and, putting them aside, would have speedily forgotten all about them. But his friends would not permit him to do so. They were angry, and when they saw clumsy dabblers in philosophy chuckling at his silence as a proof of the unanswerability of these curious arguments, they persistently and anxiously urged him to reply, in the cause of truth, and for the sake of his own dignity. His gentle nature, formed for quiet contemplation, shrank in pain from the mere idea of such uncongenial occupation. With extreme reluctance, and after he had been long teazed with repeated applications, he commenced a very troublesome and most unprofitable controversy, referring to which, in December, 1675, he mournfully blamed his own rash imprudence in "parting with so substantial a blessing as quiet to run after a shadow." To attempt the conviction of arrogant, overbearing, wilfully ignorant men, arguing rather for triumph than for truth, or naturally stupid unconvincible men, who cannot see truth, is in fact—as most men

who have tried it know—the very worst and most foolish kind of shadow-hunting. "Philosophy," said Newton, in a letter to Halley, "is such an impertinently litigious lady, that a man had as good be engaged in lawsuits as have to do with her"; and his words retain their truth to this day. Such a terror had he of controversy, that he absolutely declined to publish his completed work on Fluxions, lest new attacks should re-awaken this obnoxious thing, and once more involve him in its pain, trouble, and peace-destroying influences.

Happy and contented in his labours, Newton merely wished to be left alone to pursue the darling mistress he had wedded, the "impertinently litigious lady" of his jealous would-be rivals. She had no charms for that faithful and devoted lover apart from her beautiful self. She certainly brought him no dowry in the shape of money, and the fame her blissful favours won him were as nothing in the presence of their enjoyment. We see how poor he was in 1675, in the January of which year the Council of the Royal Society, then holding its meetings at Gresham College, in Bishopsgate-street, with our familiar old friend of the famous Diary, Samuel Pepys, in the presidential chair, brought forward a motion whereby Newton was "excused from the weekly contribution of one shilling on account of his low circumstances, as he represented."

"As he represented"! Methinks we scent here the odour of the Society's then new secretary, Dr. Hooke. They are words which may chronicle the cowardly insinuation of a doubt, and consequently an insult. By-the-bye,—a term we are rather given to using,—how few under precisely similar circumstances have the courage of honesty to admit their poverty. If it were not so, how soon the income of every society in the land would lessen, and the lists of their members grow less, for in these days, as the writer's poor dead friend, John Timbs, could have told us, we do not excuse the payment of fees to learned societies on the ground of poverty, which in this country has always been regarded, and in one way or another punished, as a crime, and it is probable, always will be.

Charles II., who prided himself nearly as much upon his taste for science as he did upon his taste for licentiousness, granted Newton a special dispensation in 1675, that he might continue his fellowship without taking orders.

In 1684, Newton's glorious "Principia" was laid in manuscript before the Royal Society, and its secretary began at last to admit the vast importance and value of its great discoveries. He claimed them for his own! But the Society, ignoring his passionate appeals and indignant denunciations, ordered the work to be printed as Isaac Newton's, at the sole expense of Mr. Newton's personal friend, the Society's clerk, Halley, the astronomer, he whom Newton sternly rebuked for his infidelity, and to whom the art of navigation is so deeply indebted.

Then the fame of Isaac Newton first took wings and went abroad into the farther regions of the earth. The disciples of Aristotle, who had refused to look through the earliest invented telescope lest it should disturb their favourite ancient theories, were still in arms against him, but his disciples began to grow and multiply in wisdom and in strength, and the end of numerous ancient errors was at hand. Yet it is curious to turn to the records of social and political life in England at this time and find how little the general public knew of, or cared for, these grand discoveries. One of the greatest mathematicians of his age, the Marquis l'Hôpital, was so anxious to know all about the wonderful Mr. Newton, how he ate, drank, slept, what he looked like, where he lived, in what kind of house, &c., that he put these and similar questions to every English man and woman he met, and he was doubtless often astonished and indignant to receive for reply "Newton! Newton! pray who and what is he, Marquis? I never met him in Society." If he had spoken of Sir Charles Sedley, how animated and talkative they would have been!

For two years Newton's "Principia" had been his life. He existed in it only; waking and dreaming, it was always before him. "Often," says Biot, "lost in the contemplation of those sublime truths he went through the ordinary duties of life without perceiving that he did so, and without his thinking principle seeming to preserve any connexion with his body. It is said that oftener than once after he had begun to dress himself in the morning, he suddenly sat down again upon his bed, arrested by some thought, and remained in that situation half-naked for hours, pursuing the idea which occupied him. He would have even forgotten to take his food if they had not reminded him of it; nay, even sometimes when he felt himself hungry before any of his meals it would not have been impossible to persuade him that he had already finished it." One day his particular friend Dr. Stukely (the famous Lincolnshire divine and antiquary) had come to dine with him in his quiet retreat at Cambridge. He waited so long for Newton to come out of the study in which he was shut up, that he began to grow faint. It was most tantalising. There was the table ready laid and the dinner upon it, and there was the doctor growing more and more hungry and faint. At last he ventured to help himself to a chicken, and, progressing slowly, had picked its bones tolerably clean and retired from the table before the philosopher entered the room. After saluting him genially, and remarking that it must be quite late for he felt very hungry, Newton sat down to the table, and lifting the cover saw the picked bones. Without the least emotion he placidly replaced it, quietly remarking, "I thought I had not dined, but I perceive I have."

We can imagine the doctor's roar of laughter and Newton's amusement when the explanation and apology followed.

King Charles "the Merry" was dead, and King James the Gloomy reigned in his stead, when the "Principia" was published; and in the same year that last-named unamiable-looking monarch thought proper to send down to the University of Cambridge one Father Francis, a Benedictine monk, with the royal command that he should be admitted as a master of arts without the exaction of the ordinary oaths of allegiance and supremacy. Such a freak of arbitrary power, interfering with the privileges of the University, and offensive to the prejudices of Protestantism, dispelled the lingering hopes of the most loyal and king-loving subjects. The vice-chancellor of Cambridge University, Dr. Peachall, and his senate declined to obey King James, and were summoned to answer for their disobedience before the most infamous and unscrupulous Judge Jeffreys. Peachall was consequently deprived of his office, and suspended from the mastership of Magdalen College.

Then sprang forth hidden and most unsuspected, fiercely burning, fire. Even the gentle, modest, peace-loving student, Newton, shared the general excitement. Cambridge was in a state of ferment. Oxford shared the wrongs of Cambridge, and also the passionate and feverish agitation. Wrath spread in every direction. James grew alarmed, and strove to repress by fear. All parties and sects were on the eve of uniting against the Government, despite the terrible punishments it inflicted. He was a daring man who stood up for the popular cause; but Newton had never displayed that quality before. He had become a strictly pious man, a stanch Protestant, and a true patriot, knowing nothing and caring little about politics; but now he shared the common indignation. As he had been the first and foremost to oppose the royal mandate, so he was the most fierce in denouncing the gross injustice of the royal Government. In that time of universal excitement, when the national Church was in sore danger and distress, the student became the patriot, ready to risk life and liberty for his country's well-being. It was a latent phase of his character, never seen before, and startling in the flash-like suddenness of its development. So deeply did it impress the popular mind in Cambridge, that when the last of the only two Convention Parliaments we have had in this country was elected, Newton was one of the representatives of that city.

It was a very cruel honour. A man more unfitted by nature for such a position could not have been discovered. If the comparatively playful and peaceful struggles of literary and philosophical controversy had been so terrible to him, awful indeed must have been the half savage, madly turbulent torrent of political strife at a period when party-feelings were wildly dominant, when men's prejudices and passions were at white heat, and a throne was tottering to its fall. The poor philosopher grew utterly confused and bewildered, his old calmness deserted him, his old feelings of diffidence and doubt were concentrated into absolute terror, his health suffered, his brain was affected, men said he was mad. At last the storm and the whirlwind which had caught him up began to cease. In February, 1690, when William of Orange was on the British throne, the Convention Parliament was dissolved. But it left Newton a changed man. He retired to Cambridge, and resumed his delightful studies, but not with the old feeling of entire and perfect devotedness.

Where Newton resided when in London for the performance of his Parliamentary duties we have not just now the means of ascertaining, but afterwards he resided, until the year 1695, almost exclusively in Cambridge, so that we have not even yet fairly brought him to the house in St. Martin's-street, where in the meantime strange changes had been going on. The rural character of that locality had been fast disappearing, and it began to assume that air of being in a foreign country, which it has ever since retained. The hedges had been disappearing in Hedge-lane, afterwards called Whitcomb-street, and new buildings were cropping up near Leicester Palace in the fields then named after it, but now known as Leicester-square. Louis XIV. "by the grace of God, king of France and Navarre," having revoked the famous edict of Nantes, had commenced that horrible persecution of the French Protestants which soon after drove 500,000 skilful and able artisans out of France. Of these about 50,000 had come to England, and settled down in Leicester-fields, Spitalfields, and Soho, to establish themselves in their trades as jewellers, watch-makers, silk-weavers, glass-blowers, &c.

Upon a piece of ground adjoining Newton's house, most probably belonging to it, aided by public subscriptions and by a grant from the Government, these unhappy fugitives had erected a place of worship, afterwards known as the Orange-street Chapel,—it is partially shown in our sketch,—wherein it is touching to find how the poor French exiles prayed in the true spirit of Christian forgiveness for the persecutor who had driven them in wild terror from their home and relatives, friends and country. "And thou," prayed one, "thou, dread prince, whom I once honoured as my king, and whom I yet respect as the Almighty's scourge, thou also shalt share my prayers, and have my good wishes."

The chapel was built in the year of the "Principia's" publication, and amongst those who would be interested most deeply in it and its builders we may be sure Newton was one. We feel as sure of that as if we had seen his short, well-set figure, and kindly, comely face, going about amongst these poor outcasts of country and kindred, who, for the sake of God and their conscience, were enduring uncomplainingly such cruel sufferings and bitter wrongs. What fearful stories they may have told him of those horrible dragonades which preceded and followed the Revocation, of painful hidings in woods and caves, where hundreds died of cold and hunger, of their being forbidden to exercise the various callings and trades whereby they had lived, of incredibly cruel insults and degradations heaped upon them, of their dead being denied Christian burial, the pulling down of their churches, and the cruelly killing of their ministers. The heart of all England was aglow with furious indignation at the story of their sufferings and in admiration of their heroism. All Europe shuddered to hear of the horrible tortures inflicted upon these truthful, simple-hearted, unoffending, and industrious people. Isaac Newton may have remembered all the things thus vividly impressed upon his mind when shortly afterwards the arbitrary acts of King James, the Papist, and the cruel, blood-thirsty doings of Judge Jeffreys fired him with patriotic rage, and brought him so unexpectedly and surprisingly to the front as a political and religious leader, when the dreary old never-quite-won battle of right against might was once more to be fought out on English soil.

Many a romantic incident of patient endurance and heroic self-devotion touched his sympathies as he went amongst these poor people with outstretched hand, giving of his little more than he could spare; and when he took up his residence amongst them a comparatively wealthy man, being Master of the Mint for Queen Anne, whose special favourite he became, and having other sources to swell his large income, he may have done so with the idea of assisting and being useful in various ways to these poor French families, for the locality was not by any means the most convenient for either his duties or his pleasures.

But we must go back once more. Following, but too closely, upon his disastrous plunge into politics, by which there is little room for doubting that his mind had been very seriously and injuriously affected, and from which he had not then recovered, came another sickening disaster, the stunning force of which only a true thinker

and student can appreciate. He was bringing to a conclusion some extremely important calculations arrived at by long and deeply pondering over each successive stage of its advancement, by fitting fact to fact with growing firmness and assurance, and was fast nearing the goal of another glorious success, when all his efforts were rendered useless in a moment. His favourite pet dog upset a lighted candle amongst his papers, and they were all destroyed. "Ah! Diamond, Diamond, thou little knowest the mischief thou hast done," is all he is said to have exclaimed on discovering his loss, but we learn from another source that, nevertheless, he "was so troubled thereat that every one thought he would have run mad, and he was not himself for a month after. Indeed, according to a letter dated May 29th, 1694, published in Lord King's "Life of Locke," his friends found it necessary to confine him.

There are some strange letters of his still preserved, in which a morbid, excitable, restlessly suspicious state of mind is displayed utterly foreign to his ordinary condition. In one of these he solicits forgiveness for having accused his true and loving friend Locke of endeavouring to "embroil him with women," of being a Hobbist, of attempting to injure his, Newton's, political character, and for having said when he heard Locke was ill and likely to die, "It were better he were dead." And in another letter, by way of explaining how these baseless ideas and suspicions got into his mind, he writes:—

"The last winter, by sleeping too often by my fire, I got an ill habit of sleeping; and a distemper, which this summer (1693) has been epidemical, put me farther out of order, so that when I wrote to you, I had not slept an hour at night for a fortnight together, and for five nights together not a wink. I remember I wrote to you, but what I said of your book I remember not. If you will please to send me a transcript of that passage, I will give you an account of it, if I can."

A letter of a somewhat similar tendency to Pepys as secretary of the Royal Society, dated September, 1693, was published by Dr. Brewster. Soon afterwards Newton appears to have been restored to his usual state of health, and to have resumed his labours, the earliest results of which were those famous profoundly elaborate epistles on the existence of a deity addressed to his friend Dr. Bentley.

In 1695 he was appointed, through the interest of a friend, of whom also he had been wrongfully suspicious at the time of his mental distemper—Mr. Charles Montague, afterwards Earl of Halifax,—to the post of warden of the Mint, whereby he secured an income of five or six hundred a year. Then it probably was that he removed to London and occupied permanently the house in St. Martin's-lane with which his name has ever since been associated. Four years after he became Master of the Mint, with an income varying from twelve to fifteen hundred a year.

In 1699 he was elected Foreign Associate of the Royal Academy of Science in France, to which it is probable our own Society of Science owes indirectly its epithet "Royal." In 1701, he was again returned to Parliament as the representative of Cambridge, to play his part in the still agitated and unsettled work of governing at a time when rumours of war were rife, and things generally were assuming a very complicated threatening aspect.

In 1703 Newton became president of the Royal Society, as the successor of John Lord Somers, and, to assume an importance suited to his position, kept a carriage, with a small establishment of three male and as many female servants. As usual he was always hospitable, kind, and, above all, charitable. Indeed, to his charity and generosity he set no bounds, and used often to observe that those who reserved their wealth to be bequeathed to the poor after their death never gave at all. He lived very humbly and frugally, and spent the bulk of his income in assisting his poverty-stricken and distressed neighbours, and in the furtherance of all causes which aimed at the spread of education and knowledge. In 1724 he wrote to the Lord Provost of Edinburgh, offering a yearly sum of 20*l.* to induce Mr. Maclaurin to fill the post of assistant to Mr. James Gregory, who was professor of mathematics in the University. The Royal Society of Edinburgh has in its museum the door of Newton's bookcase, which derives some, at least, of its interest in the eyes of Scotchmen from the fact that the great philosopher himself believed that his family was of Scottish descent.

On the 16th of April, 1705, at Cambridge, Newton was knighted by Queen Anne, who frequently declared that she considered herself happy and honoured in belonging to an age and country that could boast a genius so extraordinary. But in the same year Cambridge declined to re-elect him, and he ceased to sit in Parliament.

We see the change public life had wrought in the knightly recluse and scholar when the hot controversy arose between himself and Leibnitz on the subject of their respective claims to the original discovery of the "fluxionary," or differential calculus, on which the mild, modest, shrinking philosopher of early life has degenerated into the angry, vehement swash-buckler of paper warfare. But to the poor, and to those who needed help and sympathy, he was what he had ever been. Prosperity and fame wrought no evil in this direction, but much good. Mr. Conduit, who married his niece, says,—"I believe no man of his circumstances ever gave away so much in his lifetime in alms, in encouraging ingenuity and learning, and to his relations; nor upon all occasions showed a greater contempt of his own money, or a more scrupulous frugality of that which belonged to the public, or to any society he was entrusted for. He refused pensions and additional employments that were offered him." From the same source we learn how temperate he was, eating but little flesh, and living chiefly upon broth, vegetables, and fruit, of which he always ate very heartily.

One Tuesday in February, 1726, he came to St. Martin's-street for the last time. He had been unwell, and had been living in temporary lodgings at Kensington for the sake of improved air. His object was to attend a meeting of the Royal Society. "The next day," says Mr. Conduit, "I was with him, and thought I had not seen him better for many years, and he was sensible of it himself, and told me, smiling, that he had slept the Sunday before from eleven at night to eight in the morning without waking; but his great fatigue in going to the Society, and making and receiving visits, brought his old complaint violently upon him. He returned to Kensington on the Saturday following," and his poor, old, deserted house never saw him again. At Kensington, on the 20th of March, between one and two o'clock in the morning, strong and clear in thought, with all his mental faculties in their prime, and just after he had put aside his work for the last time, he died, aged eighty-five. His sufferings during this illness had been terrible, and Addison records for us that, when his agony was so great that drops of sweat forced themselves through a double nightcap he wore, he never complained or cried out.

We have completed the story of the old house in St. Martin's lane so far as it concerns Sir Isaac Newton, but the story of the house is incomplete. However, what we have to say of it in connexion with other famous occupants must be reserved for another paper.

Sir Isaac Newton's House, St. Martin's Fields.

MODERN STREET ARCHITECTURE IN STOCKHOLM.

THE illustration given in this number shows a good specimen of architecture in Sweden, and represents the residence of Herr Jean Bolinder, in Blasieholmen, Stockholm. When completed, it will be an ornament to the city in more than one respect. The problem the architect had to solve was not easy, although he was not fettered in his design by any instructions of the owner's, the latter having given him *carte blanche*. But other difficulties arose. The frontage is comparatively small, and the building is placed between the colossal proportions of the grand hotel on the one side and the official residence of the Norwegian Minister, with its front retired from the line of the street, on the other side. An edifice had to be designed which, by its elevation, and by the details and characteristic features of its ornamentation, as well as by a gentle rounding off at both corners, should be distinguished amidst the neighbouring buildings, thus forming, as it were, the centre-piece in the whole setting, without, at the same time, losing its own individuality. A glance at the illustration will serve to show that the problem has been satisfactorily solved.

A detailed description of the building is scarcely required. Designed in the style of the Venetian Renaissance, the work, when completed, will be a proof of Herr Zettervall's (the architect's) abilities. The ground floor is intended for shops and offices, the other floors for private residence. At the back, the central part, containing the domestic offices, juts out into a garden.

The foundation was laid in the autumn of 1874, and the superstructure was commenced in the spring of 1875. It is expected that the building will be completed in the course of 1877. The contractor for the works is Herr Thavenius, and they are carried on under the supervision of Herr Erikson, in the absence of Herr Zettervall, the architect. The greater part of the façade is executed in Portland cement, and it is decorated with about fifty columns and pilasters of polished Malmön granite. The figures and other decorative portions will be in cement and terra cotta.

Victoria (Philosophical) Institute.—The usual fortnightly meeting of this Society took place on Monday, at 10, Adelphi-terrace, when a paper was read upon the Flint Implements found in Brixham Cavern, in which the author, Mr. Whitley, alluded to the statements of Mr. Pengelly, whose active superintendence of the exploration of the cavern under the auspices of the Royal and Geological Societies was deserving of the warmest thanks of all geologists. Mr. Whitley complained that the Report of the Royal Society and the specimens had been allowed to lie by for fifteen years before being published and rendered accessible to the public. The consequence was, that for a long time theories having no foundation in fact had been promulgated as to these specimens, and several statements in regard to Brixham Cavern and its contents had been made in well-known geological works, which did not accord either with the recent Report of the Royal Society or Mr. Pengelly's subsequent one.

STREET ARCHITECTURE, SWEDEN. A RESIDENCE IN BLASIEHOLMEN, STOCKHOLM.—HERR HELGO ZETTERVALL, ARCHITECT.

NEW CHURCHES IN SOUTH LONDON.

VISIT OF THE ARCHITECTURAL ASSOCIATION.

ON Saturday afternoon, the 11th inst., the Architectural Association visited two churches now in course of erection in South London, viz., those of St. Agnes, Kennington Park, and St. Mary, Newington. The church of St. Agnes, which was first visited, is being erected from plans by Mr. George Gilbert Scott, jun., and is far advanced towards completion, the roof timbers being nearly all *in situ*. The church consists of nave, aisles, and chancel, and has a total length of about 170 ft. The style is somewhat mixed, the main features of the building being Early English, with Decorated detail introduced in some portions. The material used is brick, red bricks from Sudbury, Fareham, and South Malling being used for the exterior. The aisle walls are 2 ft. 1 in. thick, built hollow, with a 2-in. cavity, the ties consisting of bricks dipped in tar, two of them being used for every superficial yard. These walls are made hollow in order to secure a dry surface for frescoes, &c. The width of the nave is 23 ft. 6 in., and of the aisles, 15 ft. 9 in., the height to the wall-plate being 48 ft. 6 in. from the nave datum. The chancel floor will be 2 ft. 6 in. above the level of the nave. The roof of the nave and chancel is continuous, with the exception that a small bell-gable is carried up above the chancel arch. The nave and chancel roof will be boarded, and of half barrel form, the aisle roofs being vaulted in wood, with stone springers. The nave bays are 16 ft. 6 in. wide from centre to centre of the piers. Provision is made for carrying a small gallery at the west end, where will ultimately be the tower. The chancel will be divided from the nave by a screen surmounted by a rood-loft, on which the organist will have his seat, the organ being divided and placed in recessed chambers over chancel aisles. The courses of the nave piers are bedded with thick mortar-joints. The stone used throughout is Box Ground, and, in the case of the mullions and other small details, the pieces are additionally secured together by pebble dowels. An oak dado is intended to run round the wall, and also round the columns of the chancel. Messrs. Niblett & Son are the contractors, their foreman being Mr. Brown. Mr. John Kaberry, the clerk of the works, received the visitors, and kindly explained many constructive details. The contract price of this church, exclusive of the tower, is 11,000*l*.

Proceeding a short distance northward along the Kennington Park-road, the visitors arrived at the new parochial church of St. Mary, Newington. This church, as will be known to many of our readers, is intended to replace the present unsightly eighteenth-century structure which juts out so awkwardly into the roadway of the thoroughfare known as Newington-butts, about five minutes' walk north of the new church. The old church, which has long been a great impediment to traffic, will be removed soon after the consecration of the new church, which event is fixed for the 1st of May. The new church is being erected from plans (selected in limited competition) by Mr. James Fowler, architect, Louth, and comprises nave, aisles, chancel, and tower and spire. The erection of the spire is deferred at present for want of funds. The materials used are Kentish rag and Bath stone dressings, externally; and, internally, Ancaster stone for the columns and voussoirs of the nave arcade, red Mansfield stone for the detached columns in clearstory, &c., and Hassock stone, rendered with cement, for the walling. The nave is 100 ft. long by 35 ft. wide, divided into five bays, 20 ft. 5 in. from centre to centre. The roofs of the nave and the chancel are of hammer-beam construction, the height in the nave being 70 ft. from floor to ridge. The chancel is 44 ft. long by 32 ft. wide, and will rise by seven steps of 6½ in. each from the level of the nave floor. The tower is at present carried up to a height of about 80 ft., the total height of the tower and spire when completed being about 186 ft. The east end of the chancel is lighted by five large lancet lights, with a rose-window above, in addition to twelve smaller windows, six on either side, at the clearstory level. It was incidentally stated during the visit to this building that 1,000*l*. had just been given for the purpose of filling the east windows with stained glass, and providing a stone and marble pulpit. The heating will be effected by means of Haden's apparatus. Sittings are provided for 1,200 persons on the ground-floor, in addition to 150 children, who will be accommodated in a small gallery over the porch at the west end. The sittings in the nave and aisles will be open deal benches, stained and varnished, oak fittings being used in the chancel. Over the principal entrance-porch at the west end will be a sculptured representation of the Majesty, &c. Mr. Ruddick has executed the whole of the carving. The contract price is 17,500*l*., exclusive of the spire, which will cost 3,000*l*. more, making the total cost 20,500*l*. Messrs. W. Downs & Co., of Union-street, Borough, are the contractors (Mr. A. G. Cook being their foreman), and Mr. Hugh Hogan is the clerk of works. Having thanked Mr. Hogan, Mr. Downs, and Mr. Cook for their kindness in explaining the works, the members separated. We gave illustrations of this church not long ago.

HOUSES IN FLATS.

SIR,—The perusal of "A Tenant's Recollections," most graphically rendered in your last number, reminds me, unwillingly, of the French exquisite who was introduced one afternoon during the carnival season in Paris to a well-known *danseuse*. The lady apologetically intimated that she had spent the small hours of the morning at the opera ball; to which the gentleman rejoined that, inasmuch as under the circumstances she was *ravissante*, her beauty would have completely overpowered him had she retired to rest at an orthodox hour. When "A Tenant," who appears to have resided at different times in the four corners of Europe, is honestly *ravi* with a certain Glasgow "flat,"—wherein, according to the plan he has given, pantry and bed-room, kitchen and drawing-room are promiscuously huddled together,—I am tempted to inquire what effect might not a similar horizontal dwelling exercise upon him and others were it but arranged in accordance with those social and sanitary laws upon which home comforts in a great measure depend. Nevertheless, it is almost certain that were it possible for Londoners to get,—for money,—even such residences as the unwholesome "self-contained house" which your correspondent has admirably described, those uninteresting persons who profitably farm so many of the London houses, would gradually disappear, or, at least, only the "fittest" would survive; and in this colossal city a large majority of the houses situated within the four-mile radius are lodging-houses,—that is, houses inhabited by two or three families or groups. More than one satirist has told his readers how the London lodging-house keeper and his lodgers are perpetually attempting to ignore each other, and to impress upon their neighbours an idea that the house they share is a private one. The term "lodging-house" is studiously avoided by all; yet, in spite of this, there are more than fifteen hundred householders in London who are courageous enough to describe themselves in the Post Office Directory of last year as "lodging-house keepers." Indeed, in one broad street of fifty-six really good houses, leading into a fashionable square, within a mile of Regent-circus, there are twenty-five houses described as lodging-houses, and seven as private hotels. In London, such is the force of custom, no "family man" likes to admit that he occupies only part of a house. Many, therefore, fly away to semi-detached bandboxes in the remote outskirts of town, access to which is obtained very often by two miles of omnibus, five miles of railway, and a mile of walking. How socially inconvenient this custom has become may be seen any night at a London theatre. In Paris, Vienna, Cairo, or even Calcutta, it is thought impolite to rise from a seat before the performance is concluded; but, in London, ten minutes, often, before the curtain descends, confusion reigns in stalls, boxes, and pit. Anxiety is depicted upon every countenance! No heed is paid to the presence of spectators who wish to see the end of a tragedy or farce; and in this the "stalls" are frequently the worst offenders. But the reason is that most of these unfortunate pleasure-seekers live miles away. They have to catch train, omnibus, or tram, or to undergo a melancholy drive to Clapham, Brompton, or Notting-hill. The denizen of the gallery, on the contrary, strolls away in an easy and unconcerned manner to one of those slums of which central London is largely composed; and on the way probably refreshes himself at his club. But then, cry the suburbs, the advantage of inhaling fresh air at least eight hours out of the twenty-four! Town can now retort that the air to be obtained on the Victoria Embankment is quite as fresh as that which sometimes lingers over the Hampstead and Highgate ponds; and that Pall-mall is a more agreeable lounge than Haverstock-hill. My individual experience during the last dense fog proved to me that I could find my way right and morning with comparative ease in London itself, but that at the top of the Finchley-road it was difficult to follow even the lighted footway I had trodden for years.

To build slips of three-story vertical houses for the accommodation of a single family in the heart of a great city like London is, to say the least, an extravagant way of covering valuable land; and to divide such houses, after they are built, into extemporised dwellings for two or more groups of people, is to admit an absence of forethought in the owners both of the land and of the houses. Of the two, however, the freeholder is the more blind, for he does not seem to see that the value of his land would increase if the lessee were induced to build upon it twelve horizontal houses instead of six vertical ones. Only lately, to my own knowledge, a ducal ground-landlord forbade an enterprising tenant to build a house-in-flats upon the plot of ground he leased; and compelled him to erect a party-wall in the very centre of it.

The objection which Londoners evince to the "flat" system of house-building is doubtless increased by the primitive examples already erected in parts of the metropolis. Nearly all these "flats"—and I have lately visited several blocks of them—suffer from an entire absence of any systematic distribution or principle of plan. Yet nearly all are inhabited and let at comparatively enormous rentals. They possess dark and stuffy passages, with kitchens, bed-rooms, and sitting-rooms intermingled—with here and there blind closets, proclaiming that poverty of invention which devotes, in the plan, waste space that should not exist, to cupboards; and, in the elevation, attempts to enliven a dead wall with niches or panels. A primary canon of the horizontal dwelling excludes from every part of it a dark or an ill-ventilated corner. Water-closets must be lighted and ventilated not from an internal area or courtyard, but from the street. The three sections of an ordinary house—the dining and reception-rooms; the bed-rooms; the kitchen and domestic offices—must be distinct in themselves, and shut off from each other. The Parisian principle of plan which governs the architects of such buildings in Vienna, St. Petersburg, Geneva, Hamburg, and Berlin, in Turin, Naples, and Rome, in Cairo, and other Eastern cities, will not do for London. The Englishman's nose is a highly sensitive organ; and he expects his house to be fresh and pure without keeping the windows and doors perpetually open. He will not reside in a house in which the staircase is guarded by a man and wife with the chance of an additional incumbrance every ten months and a half. He will not mount more than four flights of stairs,—say forty-five steps,—at a time, although he will do this without grumbling several times a day. He will not live continuously in any building that resembles an hotel. The noise of any instrument of insular music, either of human or mechanical contrivance, which he will tolerate through a party wall, he strenuously condemns if under his feet or above his head. In fact, to make horizontal dwellings really successful in central London, where tall houses are inevitably necessary, the floors must be as thick as party-walls, and sound-resisting; and both the Parisian door-porter and the London staircase must be superseded, if not altogether abolished.

WILLIAM H. WHITE.

LIGHT AND COLOUR.

SIR,—I did not commence this controversy. My little book had been reviewed in these columns, when, suddenly, a letter appeared from your correspondent announcing that he was going to tilt at the views contained in it, *seriatim*, beginning at the preface, and going on to its end. I was therefore somewhat in fear that I should have to write another book of replies to Mr. Benson's attacks on my Revised Theory. You have, however, very kindly and mercifully limited our contention.

It is scarcely, perhaps, the acme of good taste for two writers upon the same subject to run down each other's work. I am quite sure I should have left Mr. Benson's treatises to repose on their laurels had he not assumed the function of critic. I have not, myself, the least objection to a pen tournay; but he who enters the lists to joust with me must be quite sure that he is

not equipped in glass; so, without more ado or further parley, I drive full tilt at

Mr. Benson's "Three Colour Sensations."

I find in Mr. Benson's writings the following several statements of his *leading* principle, a principle so utterly erroneous and calculated to mislead that the sooner it is borne down the better.

"*All colours* are *combinations* of *three simple sensations*." "They are sure to be some *mixture* of the *three sensations*." "So that if the *three colour sensations* are excited all at once." "The eye is so constituted in the great majority of persons as to be capable of *three simple* or *elementary sensations* of colour." "The *simple sensations* are *never* excited separately with *perfect purity*."

The foregoing passages, derived from Mr. Benson's writings, will, I think, most conclusively show that he has never thoroughly apprehended the sensuous phase of the theory of light. *Imprimis*, it may be observed that he speaks of the *three sensations* as if they were causative,—as if they were capable of being shuffled about and combined so as to produce all other sensations of colour. The several passages, indeed, exhibit a most remarkable entanglement of notions, capped, as I shall presently show, by the last, which, from a logical point of view, is the most extraordinary statement of the series. Mr. Benson, it would appear to me, has thought that the mere substitution of "sensations" for "colours," in the antiquated formula that "there are three primary colours," would rectify this ancient misstatement; if so, he is most grievously mistaken. For there are not *three elementary colour sensations*, but an infinite variety of colour sensations. This infinite variety, however, is not produced, as Mr. Benson teaches, by admixture of three *elementary sensations*, but by an external differentiation of vibratory action. When we do combine anything to produce a colour sensation differing from that produced by either of the ingredients singly, we combine things which reflect different vibrations, waves of different periodicity, not sensations. We know nothing about the sensations themselves, except that they differ the one from the other, and that they are succeeded by other sensations which are the results of reactions or librations in the nervous system. We do not mix and compound sensations, but the vibrations which produce them. The strangest enunciation of all, however, is that which is contained in the last quotation of the series, in that which affirms that these *three colour sensations* are *never* excited *separately* with *perfect purity!*" Then how in the name of science can Mr. Benson affirm that they exist? For, according to his own showing, his *three pure elementary sensations* have never been experienced, never been felt; *ergo* they are more impalpable even than sensations, mere phantoms of the writer's brain. In fact, he first sets up, and then, in his own peculiar way, knocks down, his own hypothesis,—thus showing, by his own writings, as I have previously stated, that there is very grave need for clearer teaching in reference to the sensuous phase of the theory of light.

Are there Three Elementary or Primary Wave Periods?

Seeing, then, that the sensations of colour are not themselves causative, we have no colourable pretext for calling *colour sensations* either "primaries" or "secondaries." Moreover, the excitement of a sensation of a "secondary" colour is followed by a reaction producing that of a "primary." If, therefore, the sensations were themselves causative, a "secondary" would be as much a "primary" as the "primary" itself. From the sensations themselves, therefore, we get no support for the ancient nomenclature of "primaries" and "secondaries." Let us, therefore, transfer the inquiry to the vibrations. The question, then, resolves itself into this,—Is there any valid reason for calling certain wave periods "primaries," and certain other wave periods "secondaries"? For the following reasons I think not. In the first place the only difference in the wave periods is a difference of proportion; they do not differ in kind, but only in degree. They differ, in fact, only as degrees of temperature differ. The only primary is, therefore, wave force. It would be as reasonable to call three widely-separated degrees of temperature "primaries" as the three periods of wave differentiation which produce the sensations of red, green, and blue.

Finally, let us interrogate the prism, which differentiates the solar action, so as to produce between the opposite poles of its spectrum an infinite variety of gradation of vibrations,—those vibrations which produce the colour sensations called "secondaries," as well as those which produce the sensations called "primaries." If, then, these "secondaries" are compounds,—are produced, say, by two combined wave periods,—what becomes of the integrity of the principle of *different refrangibility?* for in this case every prismatic "secondary" would be compounded of two widely differing wave periods, having precisely the same refrangibility. Which, then, shall we abandon,—the nomenclature of "primaries" and "secondaries," or the hypothesis of refrangibility? One of our famous physicists, however, has determined that all the prismatic wave periods are indecomposible; *ergo* all alike are "primaries." The law of special refrangibility was vindicated. There is, therefore, no choice left us in this matter but to abandon our long-esteemed friends the "primaries" and "secondaries."

Nevertheless, we may artificially combine two so-called primary wave periods, so as to produce the sensation of a "secondary" colour, but in this case the same authority tells us that the compounded vibrations which produce that "secondary," unlike the single wave which produces the same "secondary" colour by the prism, can be again resolved into two component elements.

Moreover, the testimony of sensation would place black and white on a par with any "primary" and "secondary"; for the sensation of a black spot is succeeded by an ocular spectrum of a white spot, and *vice versâ*. Why not, therefore, call one of these a "primary" and the other a "secondary"?

Do not let it be forgotten that the eye itself is the real field for experimentally testing colours, and that the general principle which we derive from so experimenting is that every sensation of colour of one kind is succeeded by an ocular spectrum of one of another and opposite kind, and that whichever of the two sensations is first experienced will be followed by its opposite. In sensation, therefore, it will be clear that the distinction of "primary" and "secondary" will not hold. It is evident also from the testimony of sense that all colours are so differentiated that in the entire scale of gradation for every colour on one side of the mean there is a compensating colour in a corresponding and opposite position on the other side of the scale. But as the gradation of our colour sensations must bear a certain relation to the gradation of wave periods which cause them, we may infer that the scale of wave periods corresponds with the gradations of sensation, and consequently that there must be a series of vibrations, every one of which on one side of the mean will have its corresponding, compensating, or neutralising one on the other or opposite side. The natural system of chromatic harmony is not therefore tertiary, but binary. I have experimentally satisfied myself that this is so, by observing the ocular spectrum of the prismatic scale; and when I come to the physical portion of my Revised Theory, I hope to bring the testimony of the prism to bear upon this portion of my subject.

Actinism.

Is actinism the result of vibratory action? It is the name of the virtue of the so-called chemical ray which is spoken of as if it were composed of matter emitted from the sun. If it be the result of a wave of different periodicity only, from those which are supposed to compose the solar beam, the notion may be consistent enough; but if actinism be looked upon as the chemical action of matter projected from the sun, the vibratory theory is impugned, and we should have a hybrid hypothesis of a corpuscular and vibratory system working side by side.

I have now, Sir, I think, fully shown that the theory of light is not altogether in that settled state that we can as yet fold our hands contentedly, rest, and be thankful, as Mr. Benson would have us.

W. CAVE THOMAS.

Pontefract Borough Surveyor and Inspector of Nuisances.—The Sanitary Committee recommended the Town Council to appoint Mr. Hewitt, of Manchester, Sanitary Inspector and Borough Surveyor, at a salary of 120*l.* per annum. It was strongly objected that he was no scholar. His friends said he was a good pavior, and the motion was carried.

THE NEW CATHOLIC APOSTOLIC CHURCH, CAMBERWELL NEW ROAD.

THE new Catholic Apostolic Church at Camberwell, for the denomination having their head quarters at the well-known edifice in Gordon-square, was opened recently, with much ceremony.

The edifice, which has been erected from designs furnished by Messrs. Belcher, is in the Early English style, and built of red brick, with stone dressings. In front of the main building, which is set back from the roadway upwards of 40 ft., there is a cloister. The north and south sides lead into the narthex, from which there are four separate entrances into the edifice. The church consists of a nave of five bays, the columns from which the arches spring being of blue Bath stone; also north and south aisles, transepts, and a spacious chancel 40 ft. in depth, terminating with a semicircular apse. The south transept forms a chapel, and in that on the north side is placed the organ and choir. Internally the edifice has been arranged and fitted for the peculiar services intended. It has a vaulted ceiling elaborately decorated. The chancel has nine upper windows, all of which are intended to be filled in with stained glass containing representations of our Lord in the centre, with the Apostles and four Evangelists on either side, the latter being already placed. The chancel portion of the edifice is in three divisions, viz., the sanctuary, the upper or priests' stalls, and the lower or deacons' stalls. Beyond the sanctuary is the altar-table, on which is a tabernacle, where the consecrated bread and wine are reserved for the communion of the sick. The altar is of Caen stone, with marble shafts, elevated by three steps above the level of the sanctuary. A lofty baldachino surmounts it. At the west end, under a recessed canopy or niche, is placed the font. It is in Caen stone, with red Irish marble shafts. In front there is stone carved work. A band around the font represents lilies of the valley, with four medallions, containing bas-reliefs of the Crucifixion, Resurrection, Ascension, and the Descent of the Holy Ghost. Beyond the chancel there are several distinct vestries for the priests, deacons, and choir, whilst at the west end, near the cloister, there is a retiring-room for females, together with other rooms for meetings in connexion with the church.

The builders are Messrs. Braid & Jopling, of Chelsea.

LICENCE FOR HOARDINGS.

VESTRY NO POWER TO MAKE CONDITIONS.

MR. ARNOLD, the magistrate at the Westminster Police Court, had before him recently a case of importance to the building interest, in which Mr. Chas. Hunt, of No. 1A, Longridge-road, Kensington, was summoned by Mr. Chas. Lahee on behalf of the Vestry of St. Luke, Chelsea, "for that he having been granted a licence in writing by the surveyor of the Vestry to erect a hoarding for building purposes at King's-road, Chelsea, in the said parish, did, on the 24th of February, an act not permitted by the said licence,—to wit, allow bill placards or advertisements to be affixed to such hoard."

Mr. Geo. Lewis, jun., in arguing the case for Mr. Willing, the advertisment contractor, contended that sec. 113 of the Metropolis Local Management Act (18 & 19 Vict., cap. 120) contained no such restrictive powers as those sought to be imposed by the Vestry, and cited in support of his case the arguments in an application in 1870 by Mr. Brass, the contractor, for a mandamus to the Court of Queen's Bench in 1870 to compel the Commissioners of Sewers in the City of London to issue to him a licence to erect a hoarding at the works going on at the new Post Office, St. Martin's-le-Grand. The Judges were Sir A. Cockburn and Justices Mellor and Hannen; there were three questions in dispute between Mr. Brass and the Commissioners. The third question was the most important in the present case. The Commissioners had said, "You are not to put any advertisements on the hoard," and as the Government had held out to the contractor for the works that he would have the benefit of letting the hoard for advertising purposes as long as the building was in course of erection, this would realise a considerable sum (730*l.*), and if the Court were against Mr. Brass on that point he could come on the Government for compensation caused by the loss of letting the hoard.

Mr. Lewis, in continuation, argued that the Vestry had no more right to say "You shall not

post up bills, &c.," than they had to specify the kind of wood to be used, ornamental or otherwise, or the colour; in fact, all that the licence (and the Act had laid down the terms) required was that the hoarding should be put up to protect the public from the falling of bricks or rubbish, falling into holes, or anything of that kind, and that it should be lighted at night. Now in the application he was quoting from, their Lordships agreed that all the statute required was the name of the street in which the hoarding was to be erected (and that the hoarding, if in two streets or four, was to be taken as a single hoard, and licensed accordingly), the size and time to be standing, and the word "purpose" only meant "the purpose of erecting the building," having no reference to colour, material, or advertisements; and that the licence must grant that which the Legislature intended it should grant, not something put in which the Legislature had not contemplated; and the Court made a rule absolute, in the first instance, to compel the Commissioners to grant the licence without the restrictions they had attempted to impose. Under these circumstances, he (Mr. Lewis) asked whether he need argue the case further.

Mr. Arnold asked whether, after the expression of the opinion of the Court above, the Vestry could proceed further.

Mr. Lahee, the Vestry clerk, said he would prefer to withdraw the summons.

Mr. Lewis did not ask for costs under the circumstances.

THE TRAFFIC AT HYDE PARK CORNER.

Sir,—I have not the smallest possible idea of objecting to Mr. Statham's friendly criticism on my proposal to improve the approach to Belgravia at Hyde Park-corner; but, as I now see that in trying to be brief I have managed to be obscure, perhaps you will allow me to try and make my meaning clearer on one or two points.

As every one has not the Ordnance Survey before him, I ought perhaps to have explained that as the level of the roadway on Constitution-hill is identical with that of Grosvenor-place at a distance of about 200 yards from the proposed junction, it might be made absolutely level if desired. I would prefer a slight rise, and as 1 in 100 would take it nearly up to the bend in the roadway, that was what I had in my mind; but t may be made 1 in 1,000 if any one wishes, to avoid a fall either "rapid or ignominious."

I ought, also, perhaps to have explained that the sinuous line of the park railing as I drew it had really little or nothing to do with the straight lines of the buildings opposite. Had it been proposed to erect buildings on that side, they ought, of course, to be parallel to those on the west; but the railings and the buildings are incommensurate, and do not compete with each other. No one, for instance, objects that the circular enclosures in the centre of our squares are not parallel with the rectangular buildings that surround them, and the effect here would be precisely similar. Besides this, if a roadway is sufficiently wide for the carriage traffic upon it, every additional foot is an inconvenience to foot-passengers, who have a right to be considered. I may also remark that every superficial yard added to such an unadorned gravel surface as this proposed *place*, is not only ugly in itself, but diminishes *pro tanto* the apparent size of the archway at its upper end. The consequence is that, rather than see its width increased at its lower end, I would prefer its being diminished beyond what I have drawn.

When I last wrote I avoided the architectural treatment of the arch altogether, wishing to confine attention to the practical question of the necessity of providing for the traffic; but I may now as well say that, instead of Mr. Statham's steps, what I had in my mind, to get over the difference of level between the two fronts, were two granite pedestals on the south side, in advance of the bases of the coupled columns, with couchant lions upon them, which I fancy would meet the difficulty easily, and improve the appearance of the arch to a considerable extent.

Indeed, if I dared to whisper such a thing, I would suggest that the Great Duke himself should be invited to descend from his lofty perch, where he cannot be properly seen, and only looks ridiculous, and should take his stand on a pedestal provided for him, 100 ft. in advance of the arch, at the junction of the two roadways on the south, where the statue would be seen under the most favourable circumstances in which it can be placed. If this were done, and he were replaced by a statue of Victory on the summit, and the statues and bas-reliefs of the arch were completed as originally designed, the whole group would become one of the greatest ornaments to the metropolis. As a park-gate, and the residence of a park-keeper, it is an absurdity and a sham. If treated in this manner, it would, on a smaller but still on an appropriate scale, be the exact counterpart of the Arc de l'Étoile at Paris,—not a thing to be driven through, but a triumphal archway and an appropriate memorial of the greatest victory of the great Duke.

But these are dreams that probably may never be realised, and fortunately their consideration may for the present be easily postponed; for it does not in any way interfere with the practical question of how the block of traffic at Hyde Park-corner can best be relieved, which is that to which it would be well if attention were, for the present at least, to be confined.

Jas. Fergusson.

THE LIVERPOOL NEW WATER SUPPLY.

For several months past the Liverpool Corporation have had under their consideration the question of the additional supply of water required for the borough beyond what their present sources can furnish, and up to within the last week they were undecided as to whether they would adopt the proposal by Mr. Bateman, C.E., to obtain a supply from the Westmoreland or Cumberland lakes, or rely upon certain wells, which several parties in the borough have been contending would furnish a sufficient supply in addition to that of which the Corporation are at present in possession. It now appears, however, that the well supply has been finally abandoned, on the double ground that the quantity would be uncertain, and the water itself, even if obtained in sufficient quantities, be subject to impurities. On these grounds it has been determined to adhere to the gravitation principle, and at a meeting of the Water Committee of the Corporation, the question of obtaining water from Windermere Lake or Ullswater Lake, was under consideration. Both alternative schemes have been laid before the municipal authorities by Mr. Bateman, and after much discussion the committee decided to recommend the Windermere Lake project for the council's adoption. The carrying out of either scheme would secure an ample supply of water, but Windermere possesses the advantage of being not more than eighty miles from Liverpool, whereas Ullswater is not much less than 100 miles distant. In the event of the Windermere Lake project being carried out the borough will have three distinct sources of supply, being now in possession of works at Rivington, about twenty miles from the town, by means of which a gravitation supply is obtained, in addition to the water obtained from wells in the neighbourhood of the town.

THE ART UNION OF IRELAND.

The annual drawing of prizes of the Art Union of Ireland took place on Friday, the 10th inst., in the Gallery of the Royal Hibernian Academy, Dublin. Lord Viscount Powerscourt, K.P., president, occupied the chair. From a statement made by Mr. T. A. Jones, P.R.H.A., and hon. sec. of the Union, it appears that the body is prospering. Their list had closed at 400*l.*, and they were enabled to devote a sum of 310*l.* to prizes. A small sum had also been put aside for expenses of the next year. Before the distribution of prizes took place, Lord Powerscourt delivered a discriminating address, reviewing the position of art in several of its aspects at home and abroad, and pointing to successful examples of its culture in these islands. He indicated certain requisite necessities for study, and the ends to be aimed at and avoided by artists and patrons of art. Lord Powerscourt considered that French painters, taking them as a whole, were at the present time the most highly educated school of art in Europe. The reason why he thought the French and other Continental schools were more highly educated than our own, was from the fact that the pupils of some at least of these schools abroad had to go through a more severe curriculum of study than that in use in the United Kingdom.

Ecclesiastical Dilapidations Acts.—The House of Commons have appointed a committee to inquire into the working of these Acts.

THE PROPOSED APPROACH TO THE EMBANKMENT FROM THE SAVOY, AND THE NEW MINT BUILDINGS.

The materials of the old German Lutheran Church in Savoy-street, and the south side of the Chapel Royal, Savoy, together with two other blocks of buildings adjoining on the west side, were last week sold by auction, and are now in course of removal, preparatory to the contemplated alterations in that locality, which originally included an approach from Savoy-street to the Embankment, to be constructed by the Metropolitan Board of Works, but which is now likely to be interfered with by the project of the Government to build the new Mint on the land which has been cleared facing the Embankment, and which it is understood will also absorb the site on which the old Lutheran Church, now being taken down, stands. It is, however, suggested that notwithstanding the erection of the contemplated new Mint buildings, Savoy-street might still be carried in a direction southward to the Embankment, forming a continuous line, on the west side, from the south-west corner of the burial-ground of the Chapel Royal, but not admitting of the widening of Savoy-street as at first intended by the Metropolitan Board of Works. It appears that the making of this approach will depend upon the arrangements ultimately entered into between the Government authorities and the Metropolitan Board, but there are fears that the Mint project, if carried out, will have the effect of reducing the Embankment approach from a carriage thoroughfare to a pedestrian subway.

THE NEW ASSESSMENT OF PROPERTY IN BERMONDSEY AND ELSEWHERE.

There has been a remarkable increase in the new assessment of property in Bermondsey, as compared with the re-assessments in the other parishes within the metropolis, which has led to much dissatisfaction, and to a public meeting to protest against such assessment. At this meeting, Mr. Cyrus Legg, the representative at the Metropolitan Board for Bermondsey, was one of the speakers, and he stated that the increase in Bermondsey was the highest in its rateable value in the whole metropolis. The average increase over the whole metropolis was 7·4, whilst in Bermondsey it was over 20 per cent. This showed that the parish of Bermondsey was paying more than their fair share of the metropolitan burdens. The whole of Bermondsey was rated at 20·6 per cent. above the original rating, and he thought that Bermondsey must have improved amazingly, in order that such an increase in the assessments should be placed upon it. Now in Lambeth there was a vast amount of building going on, and improvements were increasing; but they rose but 4·0 per cent.; Newington, 7·9; Camberwell, 7·8; Chelsea, 5·2; St. George-in-the-East, a little over 1·0; Mile-end Old Town, 4·2; Westminster, 6·5.; Deptford, 7·5; Greenwich, 4·7; Hackney, 9·2; Fulham, 8·5; and Penge, 6·0 per cent.; and all these were districts which had improved even in a greater ratio than Bermondsey. He gave several instances where the assessments had been appealed against, and where the parties had succeeded in getting them reduced more than one-half.

EFFECTUAL FILTRATION.

The official Water Examiner says in his last report,—The rate of filtration of the metropolitan water supply should not exceed 2½ gallons per square foot of filter-bed per hour; this will give 540 gallons per square yard each twenty-four hours, and at this rate, with properly-constructed filter-beds, filtration should be effectual. Effectual filtration is greatly facilitated by previous subsidence for several days. Of the companies drawing their supplies from the Thames, the West Middlesex and Lambeth are the only two that have at present sufficient storage capacity, or impounding reservoirs, to avoid taking in water when floods prevail.

From the report it will be seen that the Chelsea Company are proceeding with the construction of the requisite subsiding reservoirs at Molesey, and the Southwark and Vauxhall and Grand Junction Companies are preparing to construct suitable storage and other works at Hampton; when these companies have completed their improvements they should be able to avoid the floods, and supply water effectually filtered and of better quality.

THE BRITISH AND AMERICAN ARCHÆOLOGICAL SOCIETY, ROME.

ON February 11th Mr. Parker gave an instructive lecture upon the present walls of Rome, illustrated with views by aid of the lantern. At the *conversazione*, on the 14th, Mr. Tighe exhibited various coins, and the subject of the walls was discussed. The Society made an excursion on February 15th from the Porta del Popolo to the Porta Maggiore, examining the various construction of the wall in detail. On the 17th the Society visited the new Mediæval Museum, in the Collegio Romano, under the guidance of Mr. Hemans. On Friday, February 18th, the Rev. Dr. Phillip gave an interesting lecture upon the Ghetto in Rome.

At the *conversazione*, on Monday, the 21st inst., according to the *Tourist's Directory*, Mr. Parker first gave an account of the fortifications of Rome on the other side of the Tiber, including the triangular space of which the Tiber forms the base, and going up the side of the Janiculum to the apex at the Porta di S. Pancrazio, including the Church of S. Pietro in Montorio, near the summit, and the other churches in the valley between the hill and the curve of the Tiber. The wall of Aurelian, which had been carried along the opposite bank of the river from the Porta Flaminia, or del Popolo, to near the bridge called Ponte Sisto, has all been swept away by the great floods, but owing to the current running more strongly on one side than the other, one of the towers of Aurelian is still standing in the river on the northern side of the bridge. Several other towers are standing.

GLASGOW INSTITUTE OF ARCHITECTS.

A MEETING of this Institute was held on the 13th inst., Mr. John Baird, I.A., president, in the chair. Mr. John Thomson, architect, Airdrie, was unanimously elected a member of the Institute. Mr. John Honeyman brought up an interim report of the committee appointed to consider what steps ought to be taken with the view of obtaining a suitable Building Act for Glasgow:—

"1. The committee resolved that, as a preliminary to further consideration of the subject, it was desirable to obtain full information as to the provisions and practical working of the Building Acts and bye-laws affecting buildings at present in force in other large cities.

2. They therefore obtained copies of the London Building Act, the Metropolis Local Management Act, the Liverpool Building Act, the bye-laws relating to buildings in Manchester and Birmingham, and also copies of the recommendations of the Special Committee of the Glasgow Police Board, of which Mr. W. R. W. Smith was convener, and they have carefully considered these various Acts.

3. Although not yet prepared to make any definite proposals as to the details of a suitable Act for Glasgow, they deem it right, in the meantime, to report certain general conclusions which the consideration of the subject has forced upon them, and to submit certain suggestions which may be of use to members of the Institute and others while the exact terms of the desired measure are still under consideration. In general, then, the opinion of the committee at present is—(1) That the operation of a Building Act for Glasgow should not be confined within the limits of the present municipal boundaries, but should extend over a much larger area; (2) The preliminary proceedings at present necessary before leave to erect a building in Glasgow is obtained are, as compared with such proceedings in other cities, tedious, expensive, and in other respects objectionable; (3) The powers which the authorities at present possess for the efficient supervision of buildings are entirely inadequate; but it is not desirable that any additional powers should be vested in the Dean of Guild Court as at present constituted.

4. In view of the very great difficulties which must be encountered in framing an Act which may, on the one hand, effectually secure all that can reasonably be demanded in the interests of the public, without, on the other hand, unduly interfering with the rights of property and the privileges of individuals, it is of the greatest importance that the authorities should take measures to ascertain fully the views of all parties interested before taking any decided action. Your committee strongly recommend that you should take steps to bring the matter under the special notice of the Town Council, and to impress upon that body the propriety and the advantage of securing the advice and co-operation of all parties concerned while there is still time for calm deliberation.

5. In conclusion, the committee desire to offer the following suggestion:—That, inasmuch as it is evident from the information obtained that there is considerable dissatisfaction with existing Building Acts in other large cities, the discussion of the whole subject might most appropriately and usefully form part of the business of the ensuing Conference of Architects under the auspices of the Royal Institute of British Architects."

On the motion of Mr. John Gordon, I.A., the Report was adopted; and it was resolved that, before approaching the authorities as suggested in the Report, the committee should take the subject again into consideration, and bring up some definite proposals for the consideration of the Institute.

"INSTITUT DES ARTS INDUSTRIELS."

FROM Paris comes a request that we would mention that the Institution named above, the object of which is to encourage and reward efforts towards the advancement of arts, sciences, and industrial occupations, will award, towards the close of April, an honorary diploma and medals to artists, men of science, and artisans, who may be specially distinguished in the various departments.

The *Institut* will also present medals to working men, or to the foremen of *ateliers* or building yards, who may be recommended by their employers as uniting irreproachable conduct with recognised ability in their work.

Applications or claims for this distinction, written in or translated into French, and plans, models, or statements submitted with the same object, must be addressed before the 1st of April to the *Institut des Arts Industriels*, office of the *Revue Nouvelle de l'Architecture*, 16 *bis*, Cité Trévisé, Paris.

We willingly give currency to this announcement, published in the *Revue Nouvelle*, hoping that some candidates for the distinction offered may be found among our readers, especially of the artisan and art-workman class. The names of a few of the persons connected with the Institution should be given.

NORTHUMBERLAND AVENUE.

THE new roadway to the Embankment from Charing-cross was opened on the 18th inst., by Sir James Hogg, without ceremony. We confine ourselves at present to a few official details, not without interest. The formation of a subway here for gas and water pipes, after experience of that in Garrick-street, is an answer to the objections, even sneers, with which we were met when, early, we advocated such an arrangement.

The new roadway is about 1,000 ft. in length, and its width is 90 ft., divided into a carriageway of 60 ft. and two footways of 15 ft. each. The gradient for one-half its length is 1 in 90, the remainder being practically level. Carriage and foot way communications have been formed with Northumberland-street, Craven-street, and Scotland-yard, the first of which it is proposed to widen. The subway for gas and water pipes alluded to has been formed along the entire length of the street, and one of the main sewers, known as the Northumberland-street sewer, has been diverted for a portion of its length to bring it under the site of the public way, and a new sewer formed under the subway for the drainage of the houses to be erected in the new street. Plane trees have been planted on the footways next the curb, thus making the approach correspond in character with the roadway on the Embankment. The subway is of the same general character as that adopted in Garrick-street. It is of brickwork, in the form of a semi-circular arch slightly stilted, its width being 12 ft. and its height 7 ft. 6 in. The gas and water mains will be laid in this main passage, and the service-pipes will be carried from them through side arched passages—one to every two houses, so that both the main and service pipes will be accessible without disturbing the surface of the road. The street was designed and completed by Sir J. Bazalgette, C.B., and Mr. George Vulliamy, the Board's architect. The contract was let to Messrs. John Mowlem & Co. on the 25th of June, 1875, for the sum of 15,750*l*. Their contract, however, did not include the construction of the carriage-way paving, which is of wood, and which has been executed by the Improved Wood Paving Company, at a cost of about 4,500*l*. The money expended in the purchase of the property amounts to about 643,754*l*., including 500,000*l*. paid for Northumberland-house and estate; but the Board anticipate that the surplus land will sell for a very large sum. It is stated, as the result of several experiments, that while the average time occupied by a Hansom cab in travelling between Charing-cross and the Mansion-house by the Strand route is 22 minutes, the journey can be easily performed by way of the Embankment in 11½ minutes.

THE SANITARY CONDITION OF WESTHOUGHTON.

A PLAIN-SPOKEN MEDICAL OFFICER OF HEALTH.

THE Local Board of Westhoughton, near Wigan, in Lancashire, have got a medical officer of health who appears to have a habit of expressing himself in an unmistakably plain manner on the *laches* of the authorities whom he serves. At a recent meeting of the Board there was a warm discussion on certain terms contained in the medical officer's report. He complained that the Board had failed to remove certain nuisances which he had reported as prejudicial to health, and, by implication, he gravely accused the Board of having contributed to an increased mortality by not having acted upon his advice. In his report he says:—"The mortality is under 16 per 1,000. Of the dozen deaths during the month, some were drifting downwards in the direction of dotage. One-third of the deceased ought to have been alive, and *would have been* alive now had your Board, or inspector, or predecessors, or all of you, done your duty." In the discussion which followed the reading of this report, the chairman denied that the Board had thrown any obstacles in the way of the removal of nuisances. Ultimately they refused to receive the report until he explained the meaning of the terms complained of.

DAMP-PROOF BUILDING MATERIAL.

FIRE-BRICKS and other heat-resisting pottery have been manufactured in the vicinity of Gunnislake for several years. It has been reserved for the proprietors of the Phœnix Works in that locality, to make also vitrified bricks and ware, from a material that hitherto has been almost worse than useless. They seem to have thus solved a most important problem, by the manufacture of a building material which is damp-proof, and which can be produced at a reasonable price.

Common clays when vitrified are apt to swell and puff out like a pudding. Hitherto the blue "terro metallic" bricks and tiles of Staffordshire have been accepted as the sole solution of the problem.

At the Phœnix Works, however, both white and blue damp-proof bricks are manufactured thoroughly vitrified throughout, and impervious. They are not made of clay in the ordinary sense of the term, but of a soft unctuous killas, or clay slate, which abounds on the sett, and which on being exposed to the weather becomes quite friable. Experimenting upon this Mr. Cowell found that it would burn without change of shape to a semi-porcellanous substance. Two varieties of killas occur in the sett, differing chiefly in the amount of iron they contain. From one of these—the irony—blue bricks, &c., are made; and from the other white. The uses of the material are not confined to bricks, but it is worked up into paving tiles, stable pitching, kerbing, copings, damp-proof string-courses, and the like.

London Commercial Deposit Building Society.—The twelfth annual meeting of this society was held on the 6th inst. at Doughty Hall, Bedford-row, Mr. W. Hurran, chairman of the Board, presiding. The annual report, which was taken as read, stated that there had been, during the past year, an increase of 18½ per cent. in the number of investing members; of 21 per cent. in the number of borrowing members. The report says:—"The receipts have increased from 5,674*l*. 15s. 4d. in 1874, to 7,410*l*. 11s. 3d. in 1875; and the amount out on mortgage has increased from 11,380*l*. 14s. in 1874, to 13,689*l*. 4s. 8d. in 1875."

SETTING-OUT ANGLES.

A VERY simple little instrument for setting out angles of 90 deg. or 45 deg. is figured and described in the *Memorial de Ingeineros* for the 1st of January last. It is the invention of a Spanish Marine engineer, Don Casimir de Bena. It consists of a small tube, to be carried in the pocket, and small enough to be hidden in the hollow of the hand. The end, which is to be applied to the eye, is flat, with two eye-holes. At the opposite extremity of the tube is fixed a rectangular strip of glass, half silvered and half plain, forming an angle of 56 deg. 15 min. with the axis of the tube. The observer looks at an object through the tube and the unsilvered portion; then the appearance of some other object, by reflection on the silvered portion, shows that the two objects subtend at the observer's station an angle either 90 deg. or 45 deg., according to the hole through which the observation is made. A third hole, in the axis of the tube, allows of the determination of certain other angles. The instrument is perfectly simple, without movable limb, adjustment-screws, or any other additions whatever, and is reported to give very good results. Diagrams are given showing its application to a great variety of engineering work.

DAMAGES FOR EXCESS OF TIME.

MILLARD *v.* NEW CIVIL SERVICE CO-OPERATION, NEW QUEEN VICTORIA-STREET.

THIS was an action brought in the Exchequer Division of the High Court of Justice to recover the sum of 650*l.* 2s. 10d., for balance of contract dated May 10, 1875, and extra works, at No. 30, Sloane-street.

The defendants, through their managing director, paid, May 28, on account, 100*l.*; but refused any further payment unless plaintiff admitted in writing his liability for damages under the penalty clause of contract, as follows:—Certain portions were required to be finished "by the 27th day of May and the 1st day of June, and the remainder of the work to be completely finished by the 3rd day of July following." It further says:—"If the works be not completed by the *day* named, then for every day's delay after that time in the completion thereof, the said G. Millard will, on demand, pay to the said Co-operation, as and for liquidated damages, the sum of *5l.*" The plaintiff was unable to complete the first portions named on account of the extra works (ordered by their architect subsequently to the contract being signed) interfering with the fixing of fittings, &c.; but the whole was completed by the last day named, together with all the extra works. The defendants paid into court 564*l.* 14s., claiming as damages against the contractor, 45*l.*, further pleading as to the rest, "Not indebted." The plaintiff now sought to recover the balance of 85*l.* 8s. 10d.

The case was heard before Master C. H. Walton, who was clearly of opinion that plaintiff had incurred no penalty, inasmuch as the whole was completed by the last day named in the contract, together with all the extra works; at the same time offering the defendants a case for the court above. Verdict for plaintiff, with costs.

PRACTICE OF EMPLOYING PARTIALLY CLERKS OF WORKS.

THE Lord Chief Justice and a special jury, at the Queen's Bench on Saturday and Tuesday, the 18th and 21st inst., were engaged in the case of Farmer *v.* Richards, in which the plaintiff, Henry Farmer (a clerk of works), sought to recover the sum of 61*l.* 5s. from the defendant, the Rev. E. H. Richards, for services as partial clerk of works.

Mr. Day, Q.C., Mr. A. L. Smith, and Mr. Bray, were the counsel for the plaintiff; and Mr. McIntyre, Q.C., and Mr. Bowles represented the defendant.

The plaintiff, upon examination, stated that he had had nearly twenty years' experience as clerk of works, and had been employed by Sir Gilbert Scott. In 1874, the defendant, Vicar of Farlington Church, near Havant, was having a new nave added to his church, and, after repeated requests from the defendant, witness undertook to superintend the building as partial clerk of the works. Mr. Smith was the builder, and Mr. Street, the architect. Witness generally visited the works from six to eight in the morning and from four to half-past five in the afternoon. He had occasion to complain of the builder, and from time to time his work had to be re-executed. In June, 1875, Mr. Tanner (manager for Mr. Street) requested witness to give his whole time to the work; but he had objected on account of other works he had in hand. Although he had endeavoured to obtain a settlement with the defendant, up to that time he had paid nothing. Witness shortly after received a letter requesting him to send in his account, and informing him that his services would no longer be required. Previously no complaints had been made as to his supervision. He first sent in an account at the rate of 30s. per week and 10*l.* for travelling expenses, but afterwards reduced the charge to 25s. per week and 5*l.* for expenses,—61*l.* 5s.,—which was a very low charge compared with what he was receiving for his other works. In cross-examination, he said the usual weekly payment for the entire services of a clerk of works was 3*l.* 13s. 6d. He was receiving 3*l.* 3s. and 15s. per week in respect of two other engagements at the same time that he was superintending Farlington Church. Witness requested the defendant to look to the works in his (plaintiff's) absence.

George Wood said that he was the private secretary of Sir Gilbert Scott, who had employed plaintiff. A fair remuneration for a clerk of works would be 3½gs. to 4½gs. per week. For partial services 25s. per week would be a low rate. Partial clerks of works were frequently employed, and the practice was recognised in the profession. In reply to his lordship, witness said that the arrangement was a delusive one, especially where the contractor could not be depended upon.

Mr. Bowley (surveyor, of Abingdon-street, Westminster) said that the employment of partial clerks of works was frequently resorted to to save expense, and where an honest contractor was engaged the practice worked extremely well.

Mr. Kaberry (of Brixton) said that he was engaged as partial clerk of the works at St. Agnes's Church, Kennington, and at Lincoln's Inn. The employment of partial clerks of works was customary in the profession.

Mr. McIntyre, on behalf of the defendant, stated that the plaintiff when engaged would not state what his remuneration was to be, and on several occasions said that it would only be a trifle. He had admitted that he was receiving 3*l.* 3s., and 15s. from other sources whilst superintending defendant's work, which sum was more than the full payment to a clerk of works. From the way in which he had allowed the works to proceed, plaintiff was either incompetent or negligent. Defendant had tendered 26*l.* 5s., which ought to more than satisfy plaintiff for his negligent supervision.

The defendant was then examined. He said that he was rector of St. Andrew's Church, Farlington, Hampshire. Had seen plaintiff at Havant Church, and in August, 1874, engaged him as partial clerk of works at Farlington Church. During the course of the works witness called attention to the damp-course, and to the fact that the cement did not appear to set properly. White instead of grey lime was used; and bonding courses of bricks were not used where they should have been. In cross-examination, he said that he knew when he engaged plaintiff that he was also at work at a Roman Catholic chapel, and at a church at Havant. Witness did not complain of the superintendence, but left that to the architect and surveyor.

Mr. G. E. Street, R.A., said that he prepared the plans for the restoration of Farlington Church. The contract was entered into in July, 1874, and the building was to have been completed in four months. There was great delay in the progress of the works, and he had to complain of the slowness. Some of the walls had no footings, and the concrete was not properly laid. The foundations were imperfect, being composed chiefly of rubbish, with only a small layer of concrete above it. The bonding courses were omitted altogether. He ordered a thorough examination.

William Davies (stonemason), James Clear (artisan), and Mr. Richards (son of the defendant) having been examined,

Mr. McIntyre, Q.C., and Mr. Day, Q.C., addressed the jury for their respective clients.

The Lord Chief Justice then summed up, and in so doing said that there could be no question as to the imperfect and defective nature of the work; but could that have been done if the plaintiff had exercised proper supervision? He was bound to give a reasonable degree of time, diligence, and care to the task he had undertaken.

The jury, after consultation, gave a verdict for the plaintiff for the sum of 31*l.* 5s., 5*l.* beyond the amount paid into court.

DAMAGE TO STONE CARVINGS IN TRANSIT BY RAIL.

BOLTON *v.* MIDLAND RAILWAY COMPANY.

AT the Cheltenham County Court, on the 17th inst., an action was brought by Mr. Richard Bolton, stone-carver, Cheltenham, against the Midland Railway Company to recover 33*l.* 15s., for damage done to seven Bath-stone figures of angels, which the plaintiff had carved to be placed at the top of the screen in Belmont Catholic Church, Hereford, and which, on the 12th of November, were conveyed by the defendants from Cheltenham to Belmont, directed as follows:—"One case carved stone, Mr. Spray, mason, Catholic Church, Belmont, near Hereford, at the company's risk; very fragile."

The evidence went to show that the case having arrived at Belmont was opened, when it was found that four of the angels, value 6*l.* each, had been entirely destroyed, and the others damaged to the extent of 3*l.* 5s. each. One principal point in the case was whether the figures were statuary, because for the defence it was contended that if they were statuary the defendant was not bound to carry them at all, and certainly not, unless under special agreement, which did not exist in this case. Plaintiff's definition of statuary was, any marble figure able to stand alone, which the solicitor quoted from two dictionaries from 1762 to the present time, to show that the angels were statuary. It was, besides, denied that the injury to the figure was done while they were in defendant's care.

His Honour decided that the figures were statuary, but that the company were liable even in the absence of a special agreement, because their attention having been called to the contents of the parcel in the direction "carved stone," they should have extended their inquiries and discovered what was in the case. Verdict for the plaintiff to the full amount.

LIABILITY OF EMPLOYERS.

WICKS *v.* THE NATIONAL SAFE DEPOSIT COMPANY (LIMITED).

THIS was an action in the Queen's Bench Division, brought to recover compensation for personal injuries. The plaintiff is a journeyman engineer, and was employed by Messrs. Rosser & Russell, who were fitting the water and other pipes at the defendants' building, near the Mansion-house. For the purposes of their work, the workmen of Messrs. Rosser & Russell used a forge. Two days before the accident the clerk of the works gave directions that the forge should be moved from one room to another. In the room to which this was moved there was a hole in the floor, which was concealed by a board. The plaintiff being ignorant of the existence of this hole, on the 1st of April last fell through it to the floor beneath, and sustained a compound fracture of the thigh and a fracture of the jaw. During the progress of the plaintiff's case,

The Lord Chief Justice intimated that, unless the defendants were in a position to prove that the clerk of the works was not their agent, the verdict must be for the plaintiff.

In the result it was agreed that his lordship should assess the damages, which he did at 400*l.*

CLAIM AGAINST A COUNTY SURVEYOR.

ADAMSON *v.* CROZIER.

THIS claim (heard in the Darlington County Court, on the 15th inst., before Mr. E. R. Turner), was by Mr. Swanston Adamson, of Gainford, contractor, who sued Mr. Crozier, the Durham county surveyor, for the sum of 10*l.* 3s. 6d. compensation for injuries sustained in November last, as was alleged, through the negligence of defendant.

The facts were that the plaintiff, accompanied by Mr. Vaughan, left Darlington on the night of November 25th, to drive to Gainford. At Brydale Beck Bridge the vehicle was pitched over, and both occupants thrown out. There was a brazier, containing fire, at the other side of the bridge, away from the obstruction which plaintiff's vehicle encountered, and which caused the accident. Some alterations were going on, and the road on one side was 18 in. to 2 ft. higher than on the other. The snow on the road prevented the obstruction being seen. A man came up who was appointed to watch, after the accident occurred, who appeared, it was said, as if he was under the influence of drink, or had been asleep. Damage to the vehicle was sustained, the lamps being broken. Plaintiff lost his whip, and his hat was crushed. For the defence it was not sought to be shown that the road was not being repaired under the direction of Mr. Crozier, but it was argued that the claim could not be sustained against the surveyor unless it could be proved that there was negligence on his part, which had failed to be shown by the other side. The snow prevented the plaintiff from noticing the state of the road, which should be regarded more as the "act of God" than that of the defendant. His Honour gave a verdict for the plaintiff for 9*l.* 5s., with costs, considering that the light on the road was too far away from the obstruction.

DARLINGTON.

WHAT might have proved a disastrous fire was discovered the other day at Russell-street Chambers in this town, occupied on the ground floor by a depôt of the Bible Society, and the upper floor as offices. Smoke was seen coming out from the top of one of the shop-windows, and it was suspected that it was caused by the absurd practice of carrying the joists beneath the fireplace. The builder, Watson, was sent for, and workmen were set to open up the suspected fireplace, and found the two joists beneath the hearthstone smouldering away, when a cement remedy was applied.

The corporation have decided on building municipal offices at the end of the new street opening on to the market-place, when it is to be hoped the selection of competition plans will be better managed than it was with the workhouse, the roof of which was so imperfectly built that it has now to be thoroughly overhauled, and slates substituted for tiles to ease the weight on the roof.

Some of your speculating London builders are wanted down here to build cheap, so as to enable working men to have a cottage at a reasonable rent. They let now at 12 per cent. on the outlay, a pretty good return. The Skerne is being widened in its approach to the town, to save the periodical flooding the lower parts of the town are subject to, and it will then be found that the old stone bridge will prove a barrier to the flow of the flood water, and when more damage has been done the corporation will then think of making a new iron bridge in one span. That is the way they manage things in Darlington.

J. B. W.

ARMORIAL BEARINGS.

SIR,—In your paper of the 4th February (p. 219), it is stated that no person is justified in using armorial bearings who cannot show a grant upon the books of the Heralds' College, or prove that his ancestor in the male line used them before the date of the establishment of that college. Now, I happen to be one of a class of persons whose ancestors have displayed armorial ensigns upon their seals, tombs, and upon published engraved portraits at various times, from the reign of Elizabeth downwards, and yet whose arms do not appear in the Heralds' books. Some years ago I inquired whether the list of grants was perfect, and I found that such was not the case, and that the authorities of the College could not positively declare that any given crest

had not been granted or sanctioned by their body. Under these circumstances, I declined to accept a new grant placing me on an heraldic level with those whose use of armorial bearings is of modern date. No doubt the statement in your paper is in substance generally true; but I think an exception should be made by the College in favour of such persons as can show that their ancestors publicly used arms in a time when the heralds were in the habit of fining those who so used them without authority. If a man used arms before the reign of Charles II., the presumption is that he had a right to do so.

ARMIGER.

EDUCATION OF BRICKLAYERS.

SIR,—It gives me pleasure to reply to those gentlemen who have so kindly taken up this subject, and I will be as brief, clear, and to the point as possible. Mr. Houghton does not concur with me that it is the thoughtful workman who is surprised at this wide-spread ignorance. Allow me to explain, he is surprised at the ignorance when he contemplates how near and how cheap is the remedy. All the following gentlemen, as well as Mr. Houghton, seem either to forget or not to know that there are ample means for all to learn geometry, drawing, &c., at our artisans' institutes and working men's colleges; but, note what proportion of bricklayers attend the building construction classes. Not one in six. Therefore, to one who has the real interest of those connected with his own trade at heart, seeing they will not avail themselves of this opportunity, he will devise other means. The means that I propose are mutual improvement classes for bricklayers only. "Bricklayer Clerk of Works" is very hard on my position as a trade unionist, and it is to this gentleman's communication that I shall chiefly direct my reply. In his opening remarks he regrets that I omitted to explain the causes of this widespread ignorance. My reasons for so doing were that I hoped I should be answered by some of our leading unionists; but, I am sorry they are so busy as not to be able to spare a little time to a purpose that I contend would better the condition of our trade more than twenty strikes about some paltry infringement of rules. Before I proceed to explain the cause, allow me to say that there are two classes of bricklayers. One class come from the hod at manhood; the other class are bricklayers' sons, or have been at the trade from boyhood as apprentices or otherwise. The majority of the boys become good bricklayers, able to undertake any part of our trade; whilst the majority of those who come from the hod are confined to working along the line. "Bricklayer Clerk of Works" has fully explained how these men become bricklayers, therefore I need not reiterate his explanation. But he does not tell that there is a great aversion among the real bricklayers to teaching these hod-carriers, and, as their name is legion, hence the ignorance. We are also accused of encouraging this class of men into the Union. Our system of a uniform rate of wages is also designated a vicious system. Let me offer a few words in defence of the Union. Knowing that there are so many labourers turning bricklayers, the Union has a rule that no one be admitted a member until he has served three years; and it is necessary for our own protection that we take them into the Union, and obtain for them the same rate of wage as the proficient workman. Why? Because we find that masters are so grasping, that if they could obtain these men at a lower rate of wage, the skilled workman, instead of being kept on all through the job and being sought after, would only be required where there was skilled work to be done, and would be out of work half his time: there would then be less encouragement to become proficient than now, and that is not desirable. "Bricklayer Clerk of Works," if he were a foreman, would rate their pay according to their ability: would he not rather try to get his work done as cheaply as possible? Would he employ skilled labour where unskilled would do? Would he not, to curry favour with his master, try to make the unskilled do the skilled work? But I think I have said enough to defend the system of the Union: what I want to do is to make all skilled that all may deserve what they get, to raise the standard of intelligence among all, and make the bricklayer (if he already is not) able to compete with the carpenter for the leading position on the works. I hope it will not be thought that I wish to annex the classes that I propose to the Union. Not at all. As "Bricklayer Clerk of Works" suggests, let there be common ground for Union and Non-union men; but this I urge, that our lodges might be made productive of more good, if, instead of useless discussion, they were used for educational purposes; and, as a teetotaller, I would urge every right-minded bricklayer to use his influence to remove the lodge from the public-house.

I now come to the second letter by "Bricklayer Clerk of Works," in which he seems to doubt that those who have united to obtain for the unskilled workman skilled workman's pay, would object to the movement of mutual improvement. Now, having brought my proposition before the lodge, where it was freely discussed, I will state the arguments that were used against the movement,—the skilled bricklayers consider that they have a right to reserve the knowledge of skilled work to those who have come into the trade as bricklayers' sons, that is one opinion; another is, that if the (I will call him mature) bricklayer makes the young man as competent as himself, that proficiency that he has striven years to gain will be useless in his old age, because, having transferred that knowledge to those much younger than himself, the young man with skill on his side would have the preference. Now, these arguments appear reasonable enough, if they are true, but I contend that they are not; to admit that they are true would amount to saying that there is no room for improvement in the skilled departments of our trade, also that newly-acquired skill is preferable to skill and experience combined. With reference to the statement of Mr. Houghton's as to the qualifications of some clerks of works and builders' foreman, I could say much in support of it, having had to be brains and penman for them myself, in the capacity of bricklayer foreman, though these very men have been my superiors. I can also tell of an instance of a clerk of works who had been a sailor all the early part of his life, and when I first knew him could not make a dove-tailed clothes-box: he was under my tuition, we being neighbours for some time, and I freely taught him anything he asked, and in four years he was clerk of works over, I believe it was, a new workhouse,—if not, some very extensive additions. I could give many instances, but I have no wish to injure my prospects by expositions, and I am now only a journeyman bricklayer. But I feel that I have already trespassed as far as your valuable space will allow, but do hope that this movement will take some practical form; the difficulty lies in concentrating into one body all those who are in favour of the movement, and for that object I would ask all those who are willing to take part in the movement to send their names and addresses to me, 6, Angel-place, Broadwall, Stamford-street, S.E., and I will try and convene a meeting, where this question may be properly ventilated.

J. P. MORRIS.
Sec. London Lodge M. U. O. B.

*** With this, the correspondence, which, it may be hoped, has not been useless, may end.

TITHE-RENT CHARGE.

SIR,—I built a house *nine* years ago on a certain copyhold field, and the vendor has paid *tithe-rent charge* for the whole field up to last year, but, having sold his land, he refuses to pay any more. Now, though I have but one seven-roomed house myself, I am threatened with a distraint, if 1*l.* 5*s.* 3*d.* be not paid within ten days, that sum being the total charge for one year upon the whole estate. Many have larger houses thereon, and some have two or more houses, yet I am asked to pay; and the rector's agent says he cannot receive my proper proportion, but that he has power to charge and enforce the whole from *any owner* who has built on the field, further stating that the payer has power to collect of the others their proportions (how should I know what to charge them?), and in default could summon them before two justices, who have power to order payment with all costs.

If this is the law, the sooner the tithe question (as practised here, at any rate, as to building land) is legislated upon, and made something like equitable, the better.

Hanley. RECTOR'S TAX.

SUBSTITUTE FOR SLATES.

SIR,—May I be allowed to call your attention to the fact that I am now paying 70 per cent. more for slates at a Carnarvonshire quarry than I did only two years since. If present prices continue to rule (and I am told they will, and most likely become still higher) it must check the building trade, without mentioning the present high price of labour. It seems strange, in the present advanced state of science, that the chemist has not yet been able to come to our assistance in producing a good and cheap substitute for nature's rocks. A common black wine-bottle (if spread out) would cover 100 square inches at the least. These, at 9*d.* a dozen—the price I get for them—are quite as cheap as the best slates. Why could not large sheets of this common glass or slag be rolled out? Again, could not ground stone be incorporated with some vitreous ingredient which would be waterproof, durable, and not brittle? As to corrugated iron and such like metallic roofings, they either corrode in *time*, or are very expensive. A substitute has been found for oak bark (for tanning purposes) and other materials; why should not a durable and cheap one be found to take the place of slates? There *must* be a price at which the latter will become virtually prohibited. I am not *in* the building trade myself, but, as a landed proprietor who has a great deal to do in that line, I feel most seriously the present exorbitant price of slates.

P. W. YORKE.

EARLY GLASS.

SIR,—Your correspondent, Mr. O'Connor, maintains that *examples* of the *earliest* stained glass are still extant. The art is known from contemporary *writers* to have existed as early as the fourth century; yet the earliest specimen of glass that has been adduced is that of Neuwiller (Bas Rhin), dating about the middle of the eleventh century. There is thus a period of about 700 years, during which the art was practised, and yet no *example* remains.

I need not recapitulate my lecture in tracing other periods of the art, but will only remark that Mr. O'Connor will contribute a very interesting addition to the archæology of this subject if he favours your readers with *his* list of *earliest examples*. At the same time, I would say, for the sake of "the Englishman abroad," pray do not direct him for such to Milan and Seville,—cathedrals of the fifteenth and sixteenth centuries!

ALEXANDER BALLANTINE.

Improvements in Hyde Park.—Mounds of earth are now being raised on the south side of the Serpentine in Hyde Park. They are set up in convenient spaces between the fine old beech and elm trees, in such positions that, with the aid of the latter, they will form a complete screen between the Serpentine and Rotten-row when they are planted with shrubs, so that it will be impossible for any person riding, driving, or walking in the fashionable quarter to see the bathers.

WATER WASTE PREVENTERS.

SIR,—For some time past the public has been clamorous for a larger and better supply of water; the water companies have been spurred in various ways, and probably have done their best to answer to the call; but in doing so have imposed upon their tenants vexatious regulations, standing at the head of which is that abominable contrivance the water-waste preventer. Now, I make it a rule neither to praise nor blame any invention until I have fairly tested it, and having had several of these preventers fixed, and finding all bad alike, I think the time has come when we should insist on the water companies either ceasing to compel their use, or to give us something better. The design is simply inane, for, whilst the supply-pipe is of half-inch bore, the overflow pipe is only an eighth of an inch in diameter; a pipe of such diminutive size is liable to frequent stoppage, and when this takes place, or when the valve of the ball-cock acts imperfectly, then an overflow and flooding of the premises results. However, pending a change in the rules of the water companies, I would advise every one who may be annoyed with these wretched tanks to take the law into his own hands, and substitute an overflow pipe of greater diameter than the supply pipe; and when the companies find it out, and threaten pains and penalties, take them before the proper authorities, and get the rule altered,

T. E. KNIGHTLEY.

A BUILDING BEE.

THE "Spelling Bee" craze of this leap-year of grace should be utilised before it dies out by a "Building Bee" competition, at which prizes might be given for a variety of useful suggestions or satisfactory answers to questions of which the following are examples:—

What quantity of road-stuff may be used in the walls and on the walls of a room without producing dry-rot? And does sewer-gas, escaping in the basement of a house built upon a shoot, retard or accelerate the growth of the fungi?

To what extent are sites obtained, and modern houses built, with a view to obtaining damages through public improvements?

What is the best material for making artificial knots for inserting in defective wood for furniture and other purposes, and the best for "killing" these knots?

As a test for the stability of speculative buildings, ought a new Building Act to empower the local authorities to compel the builder to keep his houses in repair for the first twelve months; and if doors, door-frames, window-frames dropped out of square, joints opened half an inch wide, flooring-boards split and warped, stairs creaked and thick walls cracked, plaster fell, and drains smelt abominably, what should be the proper punishment for the delinquent Jerry for such atrocious "scamping"?

What religious or moral training would be the best suited to make the present or the next generation of civil engineers act more civilly, and speak more respectfully, of the opinions and abilities of their contemporaries, the architects?

How far is the "Queen Anne style" a piece of the patchwork quilt of William and Mary, and to what extent should the Jacobean trimmings of the previous reign still be retained?

What are the earliest instances of dome construction in the British islands, and were the builders or workmen Pagan or Christian? Did they use lime cement or not; and if dry wall masonry, how did they dispense with centreing?

A PRACTICAL BEE.

"Not Fit for a Dog to Live in."—On the 29th ult. the Wolverhampton Borough Coroner and a jury inquired into the death of the infant daughter of John M'Munn, galvanizer, residing at No. 3 Court, Eagle-street, Steelhouse-lane. The child had died in convulsions on its mother's breast, and the jury had therefore no difficulty in finding a verdict. The coroner called attention to the damp and unwholesome character of the house in which the parents lived as most injurious to health. A juror said he would not let a dog of his live in the house. Mrs. M'Munn said she had often asked the agent to put the house in proper repair, but had asked in vain.—A Juror: The landlords are fast enough in raising the rents, and they ought to be so in making the houses tenantable. The attention of the Borough Surveyor ought to be called to the place.

A PROPOSED BRIDGE ACROSS THE THAMES.

ON the 15th inst. Mr. Frederic Barnett laid before the Society of Arts a proposition for a new bridge, for providing for the traffic across the Thames below London Bridge. Mr. Barnett said,—"My patent bridge has but one approach from each shore. When these approaches have extended into the river about one-third its width, the roadway splits into two roads, each the same width as the approaches, by easy inclined angles, outwardly extending till they meet midway, thus forming a sort of angular oval or loop in the largest diameter. I have on each side two openings, practically covered and united by platforms, turning on their centres, each opening or closing by one operation. These openings permit the entrance on the port side of the largest ships that come up the Thames; there is also a sufficient width allowed for the length of the ships within the loop. From the central piers on which the turntables work, there is extended a platform uniting the two extremes, so that this platform lies with the axis of the river, dividing the loop into halves, furnishing the means of mooring the ship a few minutes alongside by mooring blocks. There are two other platforms running parallel to the chief platform, which keep the ships straight on their road. The vessels return on the opposite, still going port; thus all risk of collision is avoided. The platform will have narrow lighters, rising and falling with the tide, thus protecting both piers and vessels from injury. As soon as a vessel is about to enter the loop, the roadway on the side by which it is to enter is closed, and the vehicular and general traffic, by closing the gates (when the roads divide), is diverted to the opposite side; then immediately the turntable-bridge is opened, and the vessel enters the loop, so that when it is fairly in, the bridge is closed behind it, and, as before described, the traffic is diverted on the road behind the ship, and the opposite turntable-bridge is opened, suffering the ship to pass out on its way."

Such a structure as that proposed would block up the river and prove an enormous nuisance. Further consideration of it would seem to be useless.

STAINES TOWN HALL COMPETITION.

A SPECIAL meeting of the Staines Local Board was held on the 10th inst., for the purpose of inspecting the twenty-five plans submitted in competition for laying out the Town-hall site; and the plans having been inspected, Mr. Taylor moved, and Mr. Earee seconded,—"That all plans be rejected that do not show a considerable portion of open space for public promenade by the side of the river." This was carried unanimously. The meeting then adjourned until the 13th inst., when another meeting was held, and after the remaining plans had been discussed and inspected, it was resolved,—"That the premium of 20*l.* be awarded to the author of the plan with the motto 'Toujours fidèle' appended." It was then ordered that the clerk should communicate with Mr. Byrne, of 31, Park-street, Windsor, the author of this plan, and that the remaining plans should be returned.

RAILWAY COLLISIONS.

I HAVE read your leading article, "Recent Collisions on Railways, and the proposed Modes of Prevention." All will agree with you that a better system must be devised. (Commercially speaking, if there is an inquiry for this article it can be supplied.)

Now, Sir, to my mind, the desideratum is a self-acting automaton that will signal fore and aft in defiance of present obstacles. Let us try pneumatics; it will do much cheaply. An india-rubber bellows in a box near the rail: a passing train would act on this wind instrument, causing a sound, bell, or whistle, &c., at stations in front and rear; the bellows, by gravitation, to take ten minutes to regain its inflation, during which time a fog signal is held over the rail by metallic fingers from the box; shunters to pull the lever

1 2 3 4 5
five times, S H U N T, to signal up and down stations to that effect. R. T.

Water Supply of London.—The Home Secretary has appointed Tuesday, the 28th (at half-past two o'clock), to receive a deputation from the National Health Society on this subject.

LONDON BOARD SCHOOLS.

Two more schools have been publicly opened by the Board recently. The first, situate at High-street, Stoke Newington, nearly opposite the entrance to Abney Park Cemetery, and consisting of a three-storied building set back some distance from the road, affords accommodation for nearly 900 children. Each department (infants', boys', and girls') has school and two class rooms, with ample cloak-rooms and lavatories, the playgrounds being all in front. Mr. T. Boyce, of Hackney, was the contractor, whose tender amounted to 6,850*l.*, and Mr. Ellacott was clerk of works. The second school is placed in the Portobello-road, Bayswater, on the south side of the Metropolitan Railway, facing which is the principal front. The arrangement carried out is somewhat different to that generally adopted, the whole of the premises being on the ground floor. Nearest to the entrance in Portobello-road is placed the infants', then the girls', and, lastly, the boys' departments, each having a large schoolrom and four class-rooms, with spacious playgrounds. The schools will accommodate 1,059 children; the builders being Messrs. Kirk & Randall, of Woolwich, and the clerk of works Mr. Jefferson. The amount of the contract was 9,790*l.*; both these schools being erected from the designs of the Board architect, Mr. E. R. Robson. At the opening of the latter, both before and after the public meeting, a selection of vocal music, from the works of Mendelssohn, Rossini, Croft, and Weber, was performed by an efficient choir under the direction of Mr. E. Sibson.

The Board recently obtained tenders for the erection of a school to provide accommodation for 828 children, on the site in Buck's-row, Whitechapel, in lieu of the existing building. The following are the respective amounts:—

Timewell	£9,346 0 0
F. & F. J. Wood	9,176 0 0
L. H. & R. Roberts	9,049 0 0
Grover	8,890 0 0
Killby	8,814 0 0
Sewell & Son	8,792 0 0
Brass	8,730 0 0
Pritchard	8,595 0 0
Ennor	8,590 0 0
Sheffield	8,487 0 0
Jerrard	8,443 0 0
Nightingale	8,432 0 0
Williams & Son	8,370 0 0
Atherton & Latta	8,254 0 0

The committee recommended the acceptance of the lowest tender, that of Messrs. Atherton & Latta, of Poplar, amounting to 8,254*l.* The site contains an area of only 6,925 square feet, and as additional land could only be acquired at great expense, the school has been planned on arches, with playgrounds underneath and also on the roof, thus increasing the cost of the building in order to save a larger expenditure on the site. Cost per head of school buildings only, 8*l.* 2*s.* 7*d.* Total cost per head of buildings, including tar-pavement, &c., 9*l.* 19*s.* 4*d.*

SCHOOL BOARD SCHOOLS.

Scone.—A new Board School was opened at Scone on the 1st ult. The style is Elizabethan, and the building comprises two principal school-rooms, each 42 ft. long by 20 ft. wide, and 18 ft. high. These are separated by folding-doors, which can be thrown open at any time. Connected with these principal rooms are two class-rooms, each 24 ft. long by 16 ft. wide, and 18 ft. high. On either side of the principal school-rooms are lavatories and cloak-rooms for both boys and girls. The room used as the infants' department is large and commodious, measuring 32 ft. long by 20 ft. wide, and is 14 ft. in height. Accommodation is provided for 380 scholars. The contractors for the work were:—Mason, Mr. Mitchell, Scone; joiners, Messrs. Clunie & Wilson, Bridgend; plasterers, Messrs. Annan & Son, Perth; slater, Mr. Buchan, Perth; painters, Messrs. Stalker & Boyd, Perth; glaziers, G. R. Douglas & Son, Perth; plumbers, Ramsay, Brothers, Perth; levelling the ground and making playgrounds, Mr. Stalker, Murrayshall. The whole of the buildings were erected from plans by and under the superintendence of Mr. Macdonald, inspector of works to the Earl of Mansfield.

Brighton. — The Brighton School Board's Lewes-road schools are now completed. The style is Domestic Gothic. The chief frontage is to Fairlight-place (135 ft.). The material used is clamp brick, the grey tone of which is relieved by bands of red kiln bricks, a projecting course of this latter and a pattern-work of red, brown, and buff brick marking the division of the boys' from the girls' schools; the boys in the upper story, the girls in the lower. The windows are set in Doulting freestone, with stone mullions, cills, heads, &c., and the copings and the finials to dormers and gables are also of stone. The roof is formed of brown tiles, relieved with bands of red. The windows are glazed with diamond rough plate. The dimensions of the girls' schoolroom, adjoining the infants', are 34 ft. by 22 ft., and it is 15 ft. high. The two class-rooms connected with it are each 20 ft. by 20 ft. The boys' schoolroom is 57 ft. by 22 ft. and 18 ft. 6 in. to the ceiling. The class-rooms are of the same size as the girls'. These latter boys' rooms can be added to at any time, if necessary. At present they will accommodate 200, the girls' school 150, and the infants' 250. To each of the schoolrooms a master's or mistress's room is attached, with lavatories, hat-pegs, &c. Mr. Thomas Simpson, of Brighton, is the architect, Messrs. J. & A. Stenning are the general contractors; and Mr. Ernest Black has acted as clerk of the works. The total cost, with ground, &c., will be 7,700*l.*

Bonnybridge.—The Bonnybridge Public School, which has just been erected by the Falkirk Parish School Board, from designs prepared by Mr. T. B. M'Fadzen, architect, Edinburgh, was opened in presence of a large assemblage on the 4th instant. The school is planned on the narrow-roomed principle, to accommodate 300 pupils, and consists of large school-room, infant school-room, and two small class-rooms. The building has two principal entrances on the south side, one being for the girls and infants and the other for the boys, and they are so arranged that admission may be gained into any of the rooms without disturbing the teaching that is being carried on in any of the other apartments. The total cost has been 1,951*l.* 7*s.* 11*d.* The School Board has at the same time erected a teacher's house, at a cost of 847*l.* 19*s.* 10*d.*

Books Received.

Architectural Studies in France. By W. GALSWORTHY DAVIE, Architect, Gold Medallist R.A., and Soane Medallist R.I.B.A., 21, King William-street, Strand.

THE first part of this work, which is to consist of measured drawings and sketches (plotted on the spot) of stone, wood and iron, enamels, stained glass, encaustic tiles, tapestry, and so on, has been issued. Some of the mouldings and sculptures are given full-size, whilst others have been reduced from full-size drawings. The work is to be published in fifteen monthly parts, and when completed will contain ninety plates, including fifteen in colours. It promises to be a very useful work, and we cordially wish Mr. Davie success in his undertaking.

Miscellanea.

Alleged Libel upon a Timber Merchant by a Builder.—At the Liverpool police-court on the 7th inst., Mr. Thomas Fox was charged with libelling Mr. R. A. Weston, timber merchant and a member of the Liverpool Town Council. It appeared that some years ago the defendant was in business as a builder, and had some transactions with Mr. Weston, who, however, had to resort to law courts to obtain payment. Since that time the defendant had almost incessantly persecuted the prosecutor, calling him a gentleman robber, and accusing him of fraud of various kinds. He published these libels by means of post-cards, letters, and posting-bills, and had already been bound over for threatening Mr. Weston, to whom his conduct had become intolerable. The stipendiary magistrate suggested that the prisoner was not right in his head, and remanded him for examination by a doctor.

Art Gallery for Manchester.—Mr. Alderman Heywood announced, at the annual meeting of the School of Art at Manchester, on the 15th inst., that he had had an interview with a gentleman who desired to contribute 100,000*l.* for the purposes of an Art Gallery in that city. The committee of the school have determined to undertake the responsibility of obtaining a new School of Art, which they thought should also include an art gallery.

Rome and Britain.—At Cysicus, in Asia Minor, an inscription in Latin has been found, engraved upon a stone wall, recording a victory over the Britons, and the capture of their king Caractacus by the Emperor Claudius.

The Liability of Employers for Injuries to Workmen.—A Bill to amend the law relating to the liability of employers for injuries negligently caused to persons in their employment, has been introduced to the House of Commons by Mr. Macdonald, M.P., and read for the first time. It sets forth that "where any action or proceeding is brought for recovery of damages or compensation in respect of bodily injury or loss of life (alleged to have been occasioned after the passing of the Act) to any person, it shall not be any ground of defence that the person by whose negligence the injury or loss of life is alleged to have been occasioned, was employed in a common employment with the person injured or killed, or that the risk of injury or loss of life was knowingly or voluntarily incurred by the person injured or killed in the course of his employment." The Bill contains a proviso to the effect that the Act shall not render an employer liable in any case where the person injured or killed materially contributed to those results by his own negligence, and also another proviso which sets forth that no action shall be sustainable unless notice of action is given within six weeks or commence within six months of the occurrence of the accident. As to injuries caused to minors, the Bill provides that when compensation for damages has been recovered the Court may direct the money to be paid into the hands of some person in trust for the minor, and that the amount shall be applied for the education or advancement of the minor, or otherwise for his benefit, as the Court or Judge of the High Court of Justice may direct.

Improvements in Bristol.—At a special meeting of the Bristol Town Council, on the 10th inst., it was resolved to adopt a recommendation of the Sanitary Committee to spend 10,522*l.* in restoring the wall and footway by the side of the River Froome from Ashley-road Bridge to Wade-street, in raising the footway above flood-level, and in clearing out from the river the materials and *débris* of the old wall and footway which have fallen into it. But the Council (says the *Bristol Times and Mirror*) instead of adopting the recommendation that steps be taken to procure powers to enable the authority to execute works above the Ashley-road Bridge, at a total expenditure of 25,000*l.*, carried a resolution empowering the Sanitary Authority to call in an engineer of the "highest eminence," and suggesting that before the work is done the authority should consider in what way and in what proportion the expenses of any improvement that may be carried out can with justice be thrown upon the persons whose property will be benefited, and in what proportion upon the ratepayers of the rest of the city, many members of the Council objecting to tax the city in order to improve the low-lying ground of Ashley-road, and thus to induce a host of speculative builders to commence operations there.

The New North Porch at Bristol Cathedral.—It is stated that an "ecclesiastical difficulty" has arisen at Bristol Cathedral. In the restoration works of the nave of the cathedral now going on, a new north porch, the gift of Mr. Wait, M.P., is being added. Over the entrance is a cluster of figures in bas-relief, to which attention has been called by correspondents of the local newspapers. Exception is taken to one of the four figures which represent the Fathers of the Church. They are St. Jerome, St. Gregory, St. Augustine, and St. Ambrose; and St. Gregory is represented with the tiara, the figure being in fact, an exact counterpart of one of Pope Gregory, now being erected at the new Roman Catholic Cathedral in Clifton. The facts having been brought to the notice of the Dean of Bristol, Dr. Elliott, he has written home from Nice, ordering the work to be stopped until his return.

Belfast Architectural Association.—On the 13th of March Mr. Wm. J. Gilliland read a paper in the Museum, College-square North, on "Warming and Ventilation." Mr. John Vinycomb occupied the chair. The paper was illustrated by diagrams, including Mr. John Lanyon's lately patented ventilators. The lecturer, in the course of his paper, gave descriptions of Capt. Galton's stove, Perkins's hot-water system of pipes, and other methods of warming houses and public buildings. The theory of ventilation was entered into, and the best methods of supplying fresh air, whilst obviating draughts, described. After some remarks from Mr. Lockwood and Mr. R. M. Young, a vote of thanks to the lecturer, proposed by Mr. Braddell and seconded by Mr. Phillips, was passed.

Mr. Ruskin and Sheffield.—"Spectator in Hallamshire," writing in the *Sheffield Independent*, says:—"Our Sheffield artists have formed a society, and propose this year, at last, to hold an exhibition of pictures, to be preceded by a *conversazione*. As Mr. Ruskin has shown some little interest in Sheffield by buying a house and commencing a museum of the Society of St. George, the artists ventured to hope that he would shed upon them a few gleams of the light of his countenance. They accordingly asked him to preside at the opening of their exhibition, but he has declined in what, I suppose, we must call a characteristic letter. Mr. Ruskin will have nothing to do with Sheffield artists. No artist, he says, worth sixpence a day would consent to live in such a town, beneath a canopy of smoke, and no lover of art would take up his abode here for a million a year. Mr. Ruskin is imaginative enough to think that art may, perhaps, flourish in Hell, for he believes in the ability of the Devil to overcome natural obstacles, and consume his own smoke; but in Sheffield—pah! Don't mention Sheffield and art in the same century."

A Third-rate French Town compared with Newcastle-on-Tyne.—At a public meeting, held in Newcastle-on-Tyne, at which it was resolved to call upon the Town Council to purchase the Elswick Hall Estate for a free public park, a letter was read from Mr. Cowen, M.P., in which he said:—"I spent the greater part of the last recess in and around a country town in France. The population of the place was only 43,000. There were no manufactures. The inhabitants chiefly were interested and engaged in the growth of vines, and the raising of agricultural produce. Yet in this third-rate French town there was a public library, open every day in the week to the people, free, containing nearly 50,000 books; there were a museum and an art gallery much superior to anything in Newcastle, also free and open daily; and there were zoological gardens, with a good collection of birds and animals, equally open and free. In addition to two miles of beautiful boulevards, which constitute a magnificent promenade, there is a spacious public park four times the size of the one at Elswick, kept in excellent order, and constantly open free to the people."

The Highways Act.—A deputation, representing a large number of local boards in the parish of Halifax and Bradford, have had an interview with the President of the Local Government Board, on the subject of narrow cart and wagon wheels, and the destruction caused to roadways by reasons of heavy loads, carried by vehicles having thin wheels. The Right Hon. J. Stansfeld, M.P., introduced the deputation, and in doing so said the matter had engaged his attention when President of the Local Government Board. His own opinion was that one way of dealing with the matter would be for power to be given to the local boards to make bye-laws regulating the width of wheels on carts and wagons, the laws to be subject to the Local Government Board, which would doubtless lay down a scale suitable for the requirements of the whole country. He suggested that vehicles carrying over 600 lb. should be restricted to wheels of not less than 4 in., and carts and wagons drawn by three or more horses to have wheels not less than 6 in. in width. Mr. Solater-Booth, in reply, said the matter should have his best attention.

Lock-out of Painters at Huddersfield.—On Monday last, the 20th inst., nearly the whole of the operative painters of Huddersfield were locked out. The men had demanded, on a three months' notice, to expire on the second Saturday in April, 7d. per hour as the lowest price for work. The masters, who had hitherto paid 6d. as the lowest, offered 6½d. This the men refused, but offered to go to work for that price till the second Saturday in April if the masters would withdraw certain rules, and pending further negotiations to settle the whole dispute. The masters, contending that putting off the settlement of the dispute till the second Saturday in April would land them in the busy season and give the men a great advantage, refused the offer of the men, and demanded the adherence of the men to the rules with the compromise of 6½d. per hour.

Royal Institute of British Architects.—Mr. Charles Barry will be proposed as President for the ensuing year. The intended conference of architects will be held during the week commencing Monday, the 12th of June.

A Cathedral for a French Colony.—A cathedral church is (according to the Singapore *Straits Times Overland Journal*) to be erected in Saigon, the capital of Cochin China, and the French Government is advertising in the Hongkong papers, inviting competitive plans for the building. The cost of erection is estimated at 800,000 fcs., or about $160,000. The competition will be open till the 1st July, 1876, when all the plans and designs will be publicly exhibited in Saigon, and two prizes,—one of 8,000 fcs. ($1,600) and one of 4,000 fcs. ($800),—will be awarded to the two designs adjudged to be the best by a jury composed of seven members nominated by the French Government. Four plans must be presented for these prizes, for the approval of the jury, and, if a less number be given in, the jury will assess the value of the premiums to be paid. The successful designs will become the property of the French Government, and the unsuccessful ones will be returned to their authors. The building is to include one or two towers, belfries or domes, calculated to carry a cathedral peal of bells, and the Roman or Gothic style will be preferred to Renaissance. The Hongkong papers praise the liberality of the Saigon Government in inviting the Hongkong architects to compete, and the same liberality has been extended to Straits architects.

The Moabite Stone.—A cast of M. Clermont Ganneau's restoration of this monument has been presented by the directors of the Louvre to the committee of the Palestine Exploration Fund. The long delay of seven years in putting together the fragments which remain must be laid partly to the account of M. Ganneau's official occupations in Constantinople, and partly to his recent work of research in Palestine. The stone, as now reconstructed, is 4 ft. 1 in. long by 2 ft. 2 in. broad, having a raised border of 2 in. running round. The upper end is circular, the lower square. About two-thirds of the inscription are preserved in the fragments. There are twenty-one of these; two are of considerable size, the rest being quite small. The remainder of the inscription is made up from M. Ganneau's squeeze of the whole, and from six consecutive lines copied for him by the Arab who took the squeeze. The cast will remain a short time at the office of the Fund, 9, Pall-mall East, and will then be removed to the Society's room at the South Kensington Museum.

The Hull Borough Surveyorship.—At a meeting of the Hull Town Council on the 16th inst., Mr. Wells moved "That the Council do rescind their previous resolution adopting the report of the Amalgamation Committee, so far as such resolution confirms the appointment of a borough engineer and surveyor, at a salary of 600*l.* per annum, and that in lieu thereof the Council do offer to Mr. Joseph Fox Sharp to appoint him as borough engineer and surveyor, at a salary of 700*l.* per annum, with liberty to take pupils, and to receive for his own use the premiums paid by them, such pupils to devote their time to the service of the Corporation." Mr. Elam moved as an amendment, "That the Council offer to Mr. Joseph Fox Sharp the office of borough engineer and surveyor, at the salary of 600*l.* per annum; and that they do at their next meeting proceed to elect Mr. Sharp to such office by voting papers, agreeably to the fifth standing order of the Council." The amendment was lost by twenty-six to fourteen, and the original motion was then put and carried.

Lodging-houses and Dwellings.—A Parliamentary Return (obtained by Mr. Cawley) has just been issued of the number of lodging-houses provided by the local authorities or Commissioners under the Act 14 & 15 Vict., cap. 34. At Huddersfield there is one capable of accommodating 150 persons; the average number last year was 135; the cost was 4,185*l.*; the annual receipts as rent, 690*l.*; and the debt remaining due of the money borrowed, 2,000*l.* At Liverpool there are two places, the cost of which amounted to 17,928*l.* 16*s.*, which was repaid in October, 1869. There are twenty-six other places erected at the instance of companies and private persons, and the required particulars are given in the document now printed.

Further Dividend under the Bankruptcy of Messrs. Peto, Betts, & Crampton.—In the Court of Bankruptcy on the 13th inst., a dividend meeting was held under the failure of Sir S. Morton Peto, and Messrs. Betts & Crampton. It was reported that 29,396*l.* were available on the separate estate of Sir S. M. Peto, and 19,051*l.* on that of Mr. Betts. These amounts are to be distributed in due course.

New Steel Works near Middlesbrough.—Messrs. Bolckow, Vaughan, & Co. (Limited) have commenced the erection of very extensive Bessemer steel works near to their Cleveland ironworks. They have purchased about forty acres of land adjoining the railway, and upon this they intend to erect six new blast furnaces specially designed for smelting hematite ores, and for running the molten iron into vessels for the purpose of being conveyed direct to the Bessemer converters. In close proximity will be the appliances requisite for making Bessemer steel, and for manufacturing this into steel rails. It is confidently anticipated that in a year or so one of the largest steel plants in the country will be in active operation at Eston Junction, four miles from Middlesbrough.

Wages in the Building Trade at Nairn. The operative plasterers of Nairn gave notice to their employers three months ago that they would require an advance on their wages from and after 1st March inst. The masters acceded to the extent of ½d. per hour, so that whereas they were paid up to 1st March with 5d. per hour in town and 5½d. in the country, they now receive 5½d. in town and 6d. in the country. The masons have also received a rise of 1d. per hour, so that their wage now is 7½d. per hour in town and 8½d. in the country, and work nine hours per day.

The late Professor Parkes and Netley Hospital.—The death of Dr. Parkes, F.R.S., which occurred last week, will prove a great loss to the army and to medical science. He was acknowledged, on the Continent, no less than in England, to be one of the founders of military hygiene. "Just as his death is announced" (says the London correspondent of the *Birmingham Gazette*) "comes the rumour that Netley Hospital is to be closed. Structurally, it has never been a satisfactory building,"—for saying which, long ago, we were much abused.

The Darlington New Grammar School was begun last week, the chief contractors being Messrs. Hornsey for the brickwork and masonry, and Mr. Snaith for the carpentry. The time for completion is eighteen months, with a penalty of 5*l.* per day for non-compliance. The situation is at the west end of the town, and is a very pleasant one, being on an elevation with the old town to the chief front, and well wooded lawns and mansions in the distance at the back, the schoolmistresses' training college adjoining it on the east side.

Strike of Carpenters in Paris. — The working carpenters of Paris have turned out on strike. They demand a rise of two sous per hour, a bonus of two francs when they work on the river, and to be paid every fortnight instead of every month. The masters, it is said, are willing to grant the two first demands, but they unanimously refuse the third, for the reason that the men, by being paid more frequently, would lose more time at the wine-shop, and be less fit to do their work.

The Liverpool Timber Trade and the Dock Board.—A letter was received by the Mersey Docks and Harbour Board some time ago asking for a revision of the bye-law which restricts the discharge of deals and sawn timber to the Low Water Quay; but at the meeting of the Board held on the 16th inst., it appeared from the proceedings of the Docks and Quays Committee that they had come to the conclusion that they could not see their way to adopt the suggested alteration in the bye-laws.

Blake's Stone-breaker. — The business so long carried on at the Soho Foundry, Leeds, by the late Mr. H. R. Marsden, will still be conducted in the same name. Mrs. Marsden, the administratrix, having disposed of the foundry and business, together with the stock-in-trade, machinery, plant, and patents, to her son-in-law, Mr. George Dalton, who has been educated as an engineer, and long connected with the manufacturing department of Mr. Marsden's business.

British Archæological Association.—A joint meeting of one of the Penzance Town Council's committees and of the officers of the Penzance Natural History Society was held on the 10th inst., to concert a plan for welcoming the Association to the West. Several suggestions were thrown out, and it was resolved to invite the public to express their views at a Guildhall meeting, and to co-operate in maintaining the repute of the West for its hospitable reception of all who merit courtesy.

Moths in Carpets. — Moths will work in carpets in rooms that are kept warm in winter as well as in summer. A sure method of removing the pests is to pour strong alum-water on the floor to the distance of half a yard around the edges before laying the carpets. Then once or twice during the season sprinkle dry salt over the carpet before sweeping. Insects do not like salt, and sufficient adheres to the carpet to prevent them alighting upon it.—*The Gardener's Magazine.*

The New Museum, Rome.—This Museum was opened on Friday, the 25th of February. It is formed of the remains found in the excavations of the Municipality since Rome became the capital of United Italy. The new circular hall designed by Sig. Vespignani presents a light and elegant effect. On entering, in the centre is a fountain formed out of a magnificent marble vase found upon the Esquiline, called by the Greeks a *Rhyton*: it is the work of Pontios, an Athenian sculptor.

Trade Unions.—Last year 43 trade unions were registered, making 173 since the passing of the Act on the 29th of June, 1871, of which 29 have been dissolved; alterations of the rules of 18 trade unions were registered; 129 trade unions from which returns had been received by the Registrar of Friendly Societies show that the funds amounted on the 31st of December last to 273,757*l.*, and the annual income to 369,089*l.* There were 282,646 members

The House on the Greenhill Estate, Hampstead, which has been erected by Mr. W. H. Lascelles, for Mr. Norman Shaw, A.R.A., being now completed, the workmen employed were, through the kindness of Mr. Shaw, entertained at supper on the 10th inst. The cloth was laid in the large dining-hall, and Mr. Allan Clark, the foreman of works, presided. The house is built in the "Queen Anne" style.

Working Men's College, 45, Great Ormond-street. — The summer session will commence on Wednesday, March 29th, with a lecture at 8.30 p.m. (free to the public), by Professor J. R. Seeley, on "Stein, and the Regeneration of Prussia."

TENDERS

For premises, Conduit-street, Regent-street, for Mr. B. Benjamin. Mr. H. H. Collins, architect. Quantities by Messrs. Batstone & Sons:—

Mark	£6,365 0 0
Kirk & Randall	6,340 0 0
Brass	6,245 0 0
Merritt & Ashby (too late)	6,220 0 0
Waldram & Co.	6,210 0 0
Newman & Mann	6,115 0 0
Oliver (accepted)	5,700 0 0

For the erection of six cottages at Bryant's-place, Stroud, Kent, for Mr. J. Elvy. Mr. J. H. Andrews, architect:—

West	£1,170 0 0
Gates	1,170 0 0
Tollett	1,152 0 0
Nye	1,125 0 0
Jeffery (accepted)	1,100 0 0

For buildings on plot F, Holborn Viaduct. Mr. E. N. Clifton, architect:—

Smith & Co.	£36,999 0 0
Holland & Hannen	36,828 0 0
Macey	35,960 0 0
Brass	35,783 0 0
Peto	35,540 0 0
Conder	35,393 0 0
Ashby, Bros.	34,990 0 0
Lawrence	34,692 0 0

For new house, stables, and other offices, at Malpas, near Newport, Monmouthshire, for Mr. J. W. Jones, Mr. E. A. Lansdowne, architect. No quantities:—

Jones & Son	£2,679 0 0
Miles	2,624 0 0
Williams & Sons	2,429 0 0
Richards	2,345 0 0
Small	2,309 0 0
Prosser & Bamfield	2,300 0 0
Linton	2,300 0 0

For the erection of warehouse at Bath-buildings, Baldwin-street, for Messrs. Tubbs & Lewis. Mr. John Collier, architect:—

Cohen	£1,500 0 0
Crabb	1,493 0 0
Wicks & Bangs	1,486 0 0
Newman & Mann	1,365 0 0
Hart	1,335 0 0
Aitchison & Co.	1,325 0 0
Coleman & Son	1,345 0 0
Elkington	1,265 0 0
Scrivener & White	1,253 0 0

For finishing six houses at Potter's Bar, for Mr. F. Dimsdale. Messrs. E. Habershon & Brock, architects:—

Ward	£3,045 0 0
Mattock	2,593 0 0
Bowman	2,282 0 0
Prout	2,275 0 0

For the erection of a pair of semi-detached residences at Wood-green, N., for Mr. Thomas Clark. Messrs. Habershon & Brock, architects:—
Mattock, Bros. (accepted).

For erecting new church at Hetheragill, Cumberland. Messrs. E. Habershon & Brock, architects:—
Armstrong (accepted) £1,300 0 0

For the erection of warehouse at No. 13, Knightrider-street. Mr. G. Vickery, architect:—
Crabb (accepted) £1,450 0 0

For erection of new brewery at Cranleigh, Surrey, for Mr. G. Benford. Mr. W. Barns Kinsey, architect:—
Walker (accepted) £891 0 0

For second section of New Star Brewery, at Eastbourne, for Messrs. Alexander Hurst & Co. Mr. W. Barns Kinsey, architect:—
Walker (accepted) £2,188 0 0

For new coal-store and shop, Leatherhead, for Mr. Henry Moore. Mr. R. W. Moore, architect:—
Walker (accepted) £366 0 0

For alterations at No. 3, Savage-gardens, E.C., for Messrs. M. & N. Salaman. Mr. E. Ellis, architect:—
Mark (accepted) £356 0 0

For alterations to Nos. 18 and 20, Southwark Bridge-road, for Mr. Stannah. Mr. S. Chamberlain, architect:—

Brass	£604 0 0
Joselyne (accepted)	569 0 0

For alterations to the Royal Arms, Battersea Park-road, for Mr. N. Hardy. Mr. Henry Roberts, architect:—

Evans & Boons	£525 0 0
Street	410 0 0
Parsons	335 0 0
Hancock	323 0 0
Williams	295 0 0
Lathey, Bros. (accepted)	290 0 0

For alterations and repairs to the Fountain and Star, Nos. 31 and 32, Coleman-street, E.C., for Mrs. Stevens. Mr. James A. Hewland, architect:—

Richardson, Bros.	£545 0 0
Read & Son	478 0 0
Judd & Hawkins	389 0 0
Howard	351 0 0

For alterations and additions to shop at Balham, for Mr. English. Messrs. Tolley & Dale, architects:—

Marriage (accepted)	£425 0 0
Livett	420 0 0

For building sea-wall and making approach to Sands at Ramsgate, for the Local Board:—

Phillips	£14,580 0 0
Home	13,349 0 0
Paramor & Son	13,200 0 0
Pickering (accepted)	11,205 0 0

For erecting St. John's Lodge, Stamford-hill. Mr. A. Nickerson, architect:—

Downs & Co.	£3,360 0 0
Crabb	3,267 0 0
Ellis	3,144 0 0
Boyce	3,129 0 0
Axford	3,055 0 0
Bayes & Co.	2,903 0 0
Newman & Mann	2,836 0 0
Aitchison & Co.	2,730 0 0

For the erection of warehouse buildings in rear of Mile-end-road, for Messrs. Spills, & Co. Messrs. H. S. & C. A. Legg, architects. Quantities by Mr. W. Hawker:—

Hearle	£1,775 0 0
Ennor	1,736 0 0
Thorpe	1,675 0 0
Hunt	1,673 0 0
Judd & Hawkins	1,669 0 0

For road-making and sewerage works at Hampstead, for the British Land Company (Limited):—

Pearson	£7,777 0 0!
Richardson	5,156 0 0
Keeble	5,113 0 0
Thompson & Son	4,957 0 0
Johnson	4,950 0 0
Crockett	4,835 0 0
Dunmore	4,387 0 0
Bloomfield	4,350 0 0
Harris	4,120 0 0
Pizzey (accepted)	3,977 0 0!

For the erection of a house and stable, London Fields, for Mr. H. Grant. Mr. Edward C. Homer, architect, Quantities by Messrs. J. & A. E. Bull:—

Watts	£1,289 0 0
Dabbs	1,275 0 0
Sheffield	1,236 0 0
Staines & Son	1,223 0 0
Bangs & Co.	1,220 0 0

For additional story to warehouse, London Fields. Mr. Edward C. Homer, architect:—

Dabbs	£507 0 0
Bangs & Co.	580 0 0
Staines & Son	553 0 0
Sheffield	545 0 0
Watts	496 0 0

For schools, Peter-street, Farringdon-road. Mr. E. R. Robson, architect:—

Perry & Co.	£7,975 0 0
Williams & Son	7,871 0 0
Scrivener & White	7,841 0 0
Nightingale	7,838 0 0
Grover	7,829 0 0
Pritchard	7,767 0 0
Brass	7,750 0 0
Tongue	7,736 0 0
Ennor	7,716 0 0
Hobson	7,687 0 0
Wall, Bros.	7,608 0 0

For stabling, &c., on No. 10 Wharf, Amberley-road, for the parish of Paddington. Mr. R. Gadsden, architect:—

Clack	£1,470 0 0!
Stimpson	1,100 0 0
Vears & Co.	1,059 0 0
Temple & Forster	983 0 0
Linfield	937 0 0
Brass	890 0 0
Thomas & Butland (accepted)	880 0 0
Scowen	835 0 0
Beach	649 0 0!

For alteration and additions to Boston-road Congregational Chapel, Brentford. Mr. John W. Smithies, architect:—

Nye	£1,492	0	0
Barnes	1,477	0	0
Adamson & Sons	1,458	0	0
Taylor	1,332	0	0
Beauchamp	1,300	0	0
Gibson	1,268	0	0

For alterations and additions to house, Boston-road, Brentford, for Mr. G. Powell. Mr. John W. Smithies, architect:—

Beauchamp	£573	0	0
Barnes*	566	16	0

* Accepted, subject to amendment.

For additions, alterations, and repairs to the residence and stabling, No. 17, Finchley-road, for Mr. P. W. Reuter. Mr. R. W. Arman, architect:—

Hackworth (accepted)	£1,100	0	0

For house and stables near Newmarket, for Mr. W. S. Mitchell Innes. Messrs. Clark & Holland, architects. Quantities by Mr. S. J. Thacker:—

Longmire & Burge	£8,196	0	0
Langmead & Way	7,996	0	0
Boyce	7,893	0	0
Hill, Higgs, & Hill	7,747	0	0
Garrud	7,483	0	0
Braid & Co.	6,900	0	0

For chapel, school, and vestries, Westbourne Park-place, Paddington. Mr. J. Wallis Chapman, architect. Extra if part of the seatings are in pitch-pine, and part of the pulpit-fittings in oak:—

	Deal.	Extra for Pitch-pine.	Extra for Oak.
Battley	£8,950	£190	£84
Hook & Oldrey	7,953	100	153
Gould & Brand	7,700	79	79
Haines & Sons	7,480	100	150
Stevenson	7,467	137	118
Niblett & Sons	7,395	115	195
Garrett & Son	6,980	162	107
Braid & Co.	7,100	63	63

TO CORRESPONDENTS.

Hastings Water Supply.—Some communications on this subject have reached us too late for consideration this week.

M. N. & Co.—W.—R. W. A.—J. E.—J. P. C.—J. W. S.—G. C.—F. M.—J. A. H.—W.—E. P.—A. C.—J. H.—Mr. W.—H. P.—W. M.—C. F. P.—M. M.—E. H.—W. G. T.—J. D. H.—B. & Co.—J. A. H.—S. S. M.—E. A. L.—C. J.—H. J. J.—E. L.—Dr. D.—J. F.—H. & B.—W. S.—S. P.—E. C. H.—J. W. S.—G. C.—W. H.—H. S. S. (will be engraved of size sent).—J. P. (shall be happy to hear from him).—T. C. (too late to be of use).

We are compelled to decline pointing out books and giving addresses.

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

Advertisements cannot be received for the current week's issue later than **THREE** o'clock p.m. *on THURSDAY.*

CHARGES FOR "WANTED" ADVERTISEMENTS.

SITUATIONS VACANT.

Six lines (about fifty words) or under ..... 4s. 6d.
Each additional line (about ten words) ..... 0s. 6d.

SITUATIONS WANTED.

FOUR Lines (about THIRTY words) or under .. 2s. 6d.
Each additional line (about ten words) ..... 0s. 6d.

TERMS OF SUBSCRIPTION.

"THE BUILDER" is supplied *direct* from the Office, to residents in any part of the United Kingdom at the rate of 19s. per annum. *Payable in Advance.*

Halfpenny stamps accepted for amounts under 5s. Any larger sum should be remitted by Money Order, payable at the Post Office, King-street, Covent-garden, W.C. to DOUGLAS FOURDRINIER.

Bath Stone of best quality.
RANDELL, SAUNDERS, & CO. (Limited),
Quarrymen and Stone Merchants.
List of Prices at the Quarries and Depôts; also cost of transit to any part of the Kingdom, on application to
Bath Stone Office, Corsham, Wilts. [ADVT.]

Patent Selenitic Cement, with double the usual sand, is much stronger than ordinary mortar. Plastering finished in much less time at less cost. Excellent substitute for Portland cement for Concrete at less than half its price.—21½, Millbank-street, S.W. [ADVT.]

Asphalte.
Seyssel, Patent Metallic Lava and White Asphaltes.
M. STODART & CO.
Office:
No. 90, Cannon-street, E.C. [ADVT.]

The Seyssel and Metallic Lava Asphalte Company (Mr. H. Glenn), Office, 38, Poultry, E.C.—The best and cheapest materials for damp courses, basement passages, warehouse floors, areas, flat roofs and back additions, stables and coachhouses, footways, railway platforms, cowsheds and milk-rooms, courtyards, granaries, floors for corn, wine-cellars, terraces, skating-rinks. [ADVT.]

Whitland Abbey Green Slates.—These Quarries are now fully opened out, and are producing Slates in all sizes, and in any quantity: sound, and of choice green tint.—For samples and further particulars, apply to the MANAGER, at the Quarries, Clynderwen, R.S.O. [ADVT.]

J. L. BACON & CO.
MANUFACTURERS OF
IMPROVED HOT-WATER APPARATUS,
FOR WARMING AND VENTILATING
Private Houses, Churches, Schools, Hospitals, Manufactories, Greenhouses, &c.
OFFICES AND SHOW-ROOMS:—
No. 34, UPPER GLOUCESTER PLACE,
DORSET SQUARE, LONDON, N.W.
Illustrated Pamphlet on "Heating" post free for Twelve Stamps.

MICHELMORE & REAP,
Manufacturers of
CHARLES COLLINGE'S PATENT
COLLINGE'S PATENT HINGES, LEVER, SCREW, & BARREL BOLTS,
and IMPROVED GATE FITTINGS of every Description.
36A, BOROUGH ROAD, LONDON, S.E.
Discount to Builders.
Illustrated Sheet on application.

Just published, crown 4to. cloth, 6s.
THEORY and PRACTICE in the DESIGN and CONSTRUCTION of DOCK WALLS. By J. ROMILLY ALLEN, Assoc. Inst. C.E.
London: E. & F. N. SPON, 48, Charing-cross.
New York: 446, Broome-street.

Now ready, 12mo. half bound, price 4s.; limp cloth, 3s. 6d. (postage 4d.).
LOCKWOOD'S BUILDER'S and CONTRACTOR'S PRICE BOOK for 1876, with which is incorporated Atchley's and portions of the late G. R. Burnell's Price Books. Edited by F. T. W. MILLER, Architect, &c. with latest prices to present time. "Long known and relied on, the whole revised and re-edited."—*Building News.*
London: CROSBY LOCKWOOD & CO. 7, Stationers' Hall Court, E.C.

In crown 8vo. with Diagrams, price 8s. 6d. cloth,
THEORETICAL MECHANICS, FIRST LESSONS IN.
By J. F. TWISDEN, M.A.
Professor of Mathematics in the Staff College; Author of "Elementary Introduction to Practical Mechanics. (5th edition, 10s. 6d.)
"This book is well adapted for the use of experienced mechanics; but it will also be found an excellent introduction to the standard works by students. Professor Twisden has succeeded in freeing the subject from much of its difficulty."—*English Mechanic.*
London: LONGMANS & CO.

Part I. now ready.
ARCHITECTURAL STUDIES in FRANCE. By W. Galsworthy Davie,
Architect, Gold Medallist, R.A. and Soane Medallist, R.I.B.A.
Ninety Plates, Fifteen in Colours; size, half imperial; in Fifteen Monthly Parts. Price, to Subscribers, 30s.; Parts, 2s. 6d.; to Non-subscribers, 2l. 2s. The Work consists of Measured Drawings and Sketches (plotted on the spot) of Stone, Wood, and Iron, Enamels, Stained Glass, Encaustic Tiles, Tapestry, &c.—Subscribers' names to be forwarded to the Author, 21, King William-street, Strand, London.

NATIONAL FREEHOLD LAND SOCIETY, 14, MOORGATE STREET, LONDON, E.C.
Established 1849. Paid-up Capital, over 1,000,000l.
Advances of large or small sums are made on approved Freehold or Leasehold security, either for fixed periods or to be repaid by quarterly instalments or otherwise, as agreed, but may be repaid at any time sooner, and in any sums, at the option of the borrower.
Interest at the rate agreed upon (varying according to the nature of the security), is charged on the balance of the account from time to time.—Further particulars and forms of application for advances may be had at the Office. F. W. ROWLATT, Secretary.

ONE MILLION STERLING has been paid as COMPENSATION for DEATH and INJURIES, Caused by Accidents of all Kinds, by the RAILWAY PASSENGERS' ASSURANCE COMPANY.
Hon. A. KINNAIRD, M.P. Chairman.
Apply to the Clerks at the Railway Stations, the Local Agents, or 64, Cornhill, and 10, Regent-street, London.
WILLIAM J. VIAN, Secretary.

NORWICH UNION FIRE INSURANCE SOCIETY.
The Rates of this Society are the same as other offices, whilst Periodical Returns have been made to the parties insured by Participating Policies amounting to 478,541l.
This Office is distinguished by its liberality and promptness in the settlement of claims, 3,065,425l. having been paid to Insurers for losses by fire.
In proof of the public confidence in the principles and conduct of this establishment, it will suffice to state that
THE TOTAL BUSINESS EXCEEDS £125,000,000.
No charge is made for Policies.
Offices: 50, Fleet-street, E.C.; and Surrey-street, Norwich, 25th March, 1876.

GUARDIAN FIRE and LIFE OFFICE,
11, Lombard-street, London, E.C.
Established 1821. Subscribed Capital, Two Millions.
DIRECTORS.
CHAIRMAN—Archibald Hamilton, esq.
DEPUTY-CHAIRMAN—G. J. Shaw Lefevre, esq. M.P.

Henry Hulse Berens, esq.	Richard M. Harvey, esq.
Hy. Bonham-Carter, esq.	John G. Hubbard, esq. M.P.
Charles Wm. Curtis, esq.	Frederick H. Janson, esq.
Charles F. Devas, esq.	Beaumont W. Lubbock, esq.
Francis Hart Dyke, esq.	John R. Martin, esq.
Sir W. R. Farquhar, bart.	Augustus Prevost, esq.
Alban G. H. Gibbs, esq.	William Steven, esq.
James Goodson, esq.	John G. Talbot, esq. M.P.
Thomson Hankey, esq. M.P.	Henry Vigne, esq.

MANAGER OF FIRE DEPARTMENT—F. J. Marsden.
ACTUARY AND SECRETARY—T. G. C. Browne.

Share Capital at present paid up and invested	£1,000,000
Total Funds	3,000,000
Total Annual Income upwards of	400,000

N.B.—Fire Policies which expire at LADY DAY should be renewed at the Head Office, or with the Agents, on or before the 9th of APRIL.

IMPERIAL FIRE INSURANCE COMPANY. Established 1803.
No. 1, Old Broad-street, E.C. and 16 and 17, Pall Mall, S.W.
Capital, 1,600,000l.; Paid up and Invested, 700,000l.
Insurances against Fire on Property in all parts of the world, at moderate rates of premium. Prompt and liberal settlement of claims. Policies falling due at LADY-DAY should be renewed before the 9th of APRIL, or the same will become void.
E. COZENS SMITH, General Manager.

LONDON and SOUTHWARK FIRE and LIFE INSURANCE.
Chairman, HENRY ASTE, Esq.
Chief Office, 73 & 74, King William-street, E.C.

THE PRACTICE of an ARCHITECT and SURVEYOR, in a rising town in North Lancashire, TO BE DISPOSED OF. Seven years established. Giving up through ill-health. Price 700l.—Address, in first instance, A. W. Post-office, Barrow-in-Furness.
March 22nd, 1876.

SHARE of OFFICE.—An Architect is desirous of finding another to SHARE his OFFICE. Rent, 20l. per annum, with use of Furniture.—Address, J. B. T. Architect, No. 23, Moorgate-street, E.C.

A CIVIL ENGINEER, having OFFICES in Gresham House, Old Broad-street, E.C. is desirous of SHARING them with some Gentleman not directly connected with the profession. References required.—Address, for terms, &c. B. Z. at Brown's Advertising Office, 4, Little George-street, Westminster Abbey.

T. A. RICHARDSON, ARCHITECTURAL ARTIST, 50A, Lincoln's-inn-fields, W.C.
Perspectives and other Drawings outlined, etched, or coloured in thoroughly artistic manner. Highest references. Moderate terms. Estimates free.

MR. BANISTER FLETCHER begs to give NOTICE that he will shortly REMOVE to larger OFFICES at No. 29, NEW BRIDGE STREET, E.C. His District Office will remain as heretofore.

ASSISTANCE rendered to Architects in Town and Country, in the Preparation of Designs, Details, Working Drawings, Competitions, Specifications, &c. Perspectives in outline or etched, and all architectural work without delay, by a competent Man, of fifteen years' experience.—Address, 230, Office of "The Builder."

PARTNER WANTED, with 5,000l. to join the Advertiser in the MANUFACTURE of TERRA-COTTA WARE, for Architects, Builders, and Others, for which there is a large and growing demand. Numerous references can be given as to important works executed in England, India, and America, the last twenty-five years. Medals have been awarded for these works at several of the great exhibitions.—Address, S. care of Mr. Beal, 28, Regent-street, Waterloo-place.

BOROUGH of NEWARK, in the County of NOTTINGHAM.—URBAN SANITARY AUTHORITY of NEWARK.—Notice is hereby given that the Urban Sanitary Authority of Newark will at a meeting to be held on FRIDAY, 7th day of APRIL next, proceed to the APPOINTMENT of a SURVEYOR. The salary to be paid will be 80l. a year. The person appointed will be allowed to carry on private practice, but will be required personally to perform the duties of the Office of Surveyor, and will be required to conform to the regulations now made or hereafter to be made with reference thereto by the above Authority, and will be required to commence his duties on the 17th day of APRIL next. Applications for the appointment, together with recent testimonials, must be sent on or before the 6th APRIL next to my Office, Newark, where a copy of the Regulations of the Urban Sanitary Authority with reference to the Office of Surveyor may be seen by any one intending to become an applicant for the Office. Personal attendance of applicants will not be required.—By order,
GODFREY TALLENTS, Jun. Clerk to the U. S. Authority.
March 20th, 1876.

MERTHYR TYDFIL LOCAL BOARD of HEALTH.—ASSISTANT SURVEYOR.—The Board requires the SERVICES of a competent person as ASSISTANT SURVEYOR. One who has had experience in the performance of duties appertaining to the office of Town Surveyor will be preferred. The salary will be 100l. a year. The person appointed will be required to devote the whole of his time to the service of the Board under the direction of the Board's Surveyor. Applications, endorsed "Assistant Surveyor," with recent testimonials, to be left at my Office, 71, High-street, Merthyr Tydfil, on or before the 3rd day APRIL next. Further particulars may be obtained on application to the Board's Surveyor.
THOMAS WILLIAMS, Clerk.
Merthyr Tydfil, March 16th, 1876.

BOROUGH of SOUTHAMPTON.—ASSISTANT WANTED, in the Office of the Borough Surveyor. He must be competent to survey, level, and make fair and working detail drawings, and possess a knowledge of building construction. Salary 100l. per annum. Applications with testimonials from previous and present employers only, to be sent to me at my Office, on or before FRIDAY, the 31st instant.
JAMES LEMON, Borough Surveyor, Southampton.
March 14th, 1876.

GLAMORGANSHIRE HIGHWAYS.—To SURVEYORS.—Notice is hereby given, that the County Roads Board or the County of Glamorgan will meet on WEDNESDAY, the 26th day of APRIL, 1876, at the Town-hall, Bridgend, in the said county, at TWELVE o'clock at Noon, and then and there proceed to the appointment of SURVEYOR of the HIGHWAYS in the Pontardawe Highway District, with a salary of 80l. a year. The Surveyor of Highways must reside within his district, and devote his whole time to the duties of his office, unless appointed Sanitary Inspector to the Pontardawe Union, in which case an exception to this rule will be made. If the Surveyor misconduct himself he may be dismissed at any meeting of the County Roads Board; but if for any other cause the Board should desire his removal, or the Surveyor shall be desirous of resigning, three calendar months' notice shall be given by either party. The names of two sureties for the sum of 300l. for the due discharge of the duties, must be sent in with testimonials. The Surveyor will not be required to keep a horse. Persons desirous of obtaining the above appointment are requested to send testimonials, addressed to the County Roads Board, under cover to me, on or before the 20th day of APRIL, 1876.
THOS. M. DALTON, Clerk to the County Roads Board.
No. 6, Woking-street, Cardiff.

PONTARDAWE UNION. — PUBLIC HEALTH ACTS.—INSPECTOR of NUISANCES WANTED. Notice is hereby given, that the Guardians of the Pontardawe Union, acting as the Rural Sanitary Authority, will, at their meeting, to be holden at the Union Office, Pontardawe, on THURSDAY, the 13th day of APRIL next, at ELEVEN o'clock in the forenoon, proceed to the APPOINTMENT of an INSPECTOR of NUISANCES for the Union, at a salary of 120l. per annum. The district comprises the Parishes or Hamlets of Killibebill, Llangwicke, Mawr, Rhyndwyclydach, Ynisymond, Ystradgynlais Higher, and Ystradgynlais Lower, containing a population, according to the census of 1871, of 17,489. The person appointed must reside in the district, devote the whole of his time to the duties of the office (unless appointed Surveyor of Highways for the Pontardawe District, in which case he will be allowed to hold both appointments), and be fully competent to perform all the duties required by the Guardians, and such as are prescribed by the regulations of the Local Government Board. Applications, stating age and present occupation, in the handwriting of each candidate, accompanied by recent testimonials for this appointment specially, and not exceeding six in number, to be sent to me at my Office at Pontardawe, not later than WEDNESDAY, the 29th MARCH instant. Canvassing the guardians is strictly prohibited, and will be held to be a disqualification.—By order,
D. B. TURBERVILLE, Clerk.
Union Office, Pontardawe 11th March, 1876.